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EDITORIAL

HOUSE COMMITTEE CONSIDERS FORESTRY PROGRAM

THE underlying principles of the forest program incorporated in the so-called Snell forestry bill (H. R. 15327) received thorough airing before the House of Representatives Committee on Agriculture the latter part of January. Lack of time unfortunately prevented the presentation of oral arguments covering the entire bill, but briefs on all of the various sections were filed with the Committee for incorporation in the printed report. In the hearing itself only the first two sections, providing for co-operation between the Federal Government and the States in forest fire protection and forest renewal, were covered.

The two fundamental points brought out in the arguments presented were that there is urgent need for the immediate adoption of a comprehensive forest policy, and that the problem is a national one in the solution of which the Federal Government must take the leading part. Colonel Greeley, speaking in behalf of the

Forest Service, pointed out convincingly that the devastation of the forests has now reached a point where the future of our timber supplies can not be left entirely to the action of the private owner, whose guiding motive is naturally financial gain, and where some degree of public control over fire protection and methods of cutting is essential for the public welfare. The Snell bill proposes leaving such public control to the individual States, working in co-operation with and assisted by the Federal Government. Now that the Committee to which the bill has been referred has heard both the pros and cons of this proposal it is to be hoped that rapid progress can be made in agreeing upon a practical program of legislation. Certainly one of the first things which the special session of Congress should take up is the consideration of measures to safeguard the future timber supply of the country.

THE REDWOODS A NATIONAL POSSESSION

NEXT in instant need to the saving of our National Parks and Monuments from the determined effort to invade them which commercial interests are now making in Congress is that of holding back from the busy ax examples of the remnants still remaining of the magnificent redwood forests of the Pacific Coast. Both National Parks and redwood forests are unique in the whole world of nature. Both are necessary to the record which it is this nation's great privilege to hand down to the world's posterity. Both have extreme importance to the science of today and especially of tomorrow. Both are items of first importance in this nation's unique exhibit to civilization. Already the practical results of American nature conservation are the envy and the model of sister nations in two hemispheres.

The purpose of this editorial is to proclaim the fact that the California redwoods are Californian only in location and name. Essentially they are a priceless national possession, as national as Yellowstone Lake, the Washington Monument, the Grand Canyon or the National Capitol. The movement to save them must be as national as that mighty protest which is rolling up from every State in these United States against the violation of our National Parks.

There is this important difference between the im-

perilled situations of the National Parks and of the remaining fragments of the redwood forests, that the National Parks already are the possession of the nation and the redwood forests are owned by lumber interests which even now are wielding the ax and saw with the utmost vigor. The one is a defensive movement, the other aggressive; these forests must be acquired by private and public purchase.

Some day, for one thing, we must have a Redwoods National Park. Director Stephen T. Mather, of the National Park Service, has greatly helped to establish the national character of the movement by his determined work and personal contributions. So have such influential easterners as Madison Grant, president of the New York Zoological Society, and Henry Fairfield Osborn, president of the American Museum of Natural History. Nearly every State is furnishing its earnest workers. In the far west men like William Kent, who gave the Muir Woods to the nation, himself a lumberman, are giving freely of their time and money. Mr. Kent's personal contribution, like Mr. Mather's, was \$15,000.

But it is not proposed that private individuals should contribute all the money needed for these purchases, which may require a million or more before enough of these lands are acquired. Californian counties adjoining

these forests and the State itself are expected to help, and the National Government, it is earnestly hoped, may acquire its own National Park.

The great need now, however, is the awakening of the people to the emergency, and the wide expression of

their sympathy. In that cause every practitioner and student of forestry may find a nationally useful and a congenial field of work, one where his influence will count manifold because of his personal interest in forestry and his knowledge of trees.

BOYS, GIRLS, AND FIRE

REDUCING fire loss by means of fire prevention education for the boys and girls in public, private, and parochial schools throughout the country is the latest and should prove one of the most effective methods of fighting the fire evil. The stand taken by the Fire Marshals' Association of North America in favor of the passage by all State legislatures of laws for the compulsory teaching of fire prevention in the schools of their respective States is assuredly a move in the right direction. Not only can the importance of fire prevention be impressed on children more readily than on grown-ups, but the grown-ups themselves can be reached most effectively through the children.

The Fire Marshals' Association has proposed a model law empowering the State Fire Marshal and Commissioner of Education in each State jointly to provide a course of study in fire prevention and requiring each teacher in public, private, and parochial schools to devote not less than one hour during each month of the school year to the instruction of the pupils in the prevention of loss and damage to lives and property through preventable fires. New Jersey has already enacted legislation along these lines, and assurance that the proposition will receive respective hearing in other States is given by the fact that in addition to the Fire Marshals' Association the movement has the support of the National Board of Fire Underwriters, the National Association of Credit Men,

the United States Bureau of Education, and the Forest Service.

The part that a movement of this sort may play in reducing losses from forest fires, which now aggregate nearly \$20,000,000 a year, is difficult to overestimate. In teaching the children ways and means of preventing forest fire losses it is also important that they should be taught the reasons why such protection is essential and one of the prime duties of all good citizens. They should be taught in a general way, for instance, the place which forests and forest products play in the life of the Nation and that the protection of the forests, including both virgin timber and cut-over lands, is essential for their perpetuation. If these facts are brought home to them there will be no question as to their readiness to do their share in increasing our forest protection by reducing to a minimum the number of man-caused fires and the damage done by them. Co-operation of the children of the country, both now and after they cease to be children, will be one of the important factors in making really effective any comprehensive forest policy. The movement to secure this co-operation through forest fire prevention education throughout the schools is deserving of the heartiest support from educators, newspapers, commercial organizations, timberland owners, foresters, and the public generally.

AN UNTENABLE POSITION

DURING the winter the Washington State Board of Forestry has issued a detailed statement of forest policy which is in the main a reiteration of the principles outlined by it last March. While this statement of policy contains many excellent features, such as emphasis on fire protection, land classification, study of forest taxation, research in forest production and the utilization of forest products, and acquisition of State forests, it is marred by its opposition to the National Forests. This is an unfortunate and untenable position for any State to take.

As Colonel Greeley stated in commenting on the declaration of the board last spring, "The problem of supplying this country with newsprint, lumber, and other forest products is not a State problem or a local problem; it is just as much a national problem as our railroad transportation system and our merchant marine. . . . With so much idle forest land, with all the difficulties which are making private owners slow to take up the business of growing timber, I do not see how there can be any question that the Federal Government, as well as the State Governments, should go into this enterprise on the

largest scale of which they are capable. I therefore feel that the policy of extending federal forest holdings, both by purchase and by land exchanges, particularly with a view to acquiring cut-over land capable of growing timber, is absolutely sound and will commend itself to the great majority of people in the West."

In the 16 years that the National Forests have been under the administration of the Forest Service the policy underlying their creation has found ample justification. In its handling of them the Forest Service has proved that publicly owned forest lands can not only be administered efficiently, but in such a way as to retain their productivity and to contribute to the stability and permanence of local communities dependent in whole or in part on lumbering and other wood-using industries. Thanks to the creation of the National Forests, the country has a large body of forest lands under public ownership which will become increasingly valuable as a reserve for supplying the needs of the country as the timber in private ownership becomes more and more exhausted. Furthermore, they furnish the most conclusive

kind of demonstration as to the feasibility and advantages of practicing forestry.

It is of the utmost importance that the present area of National Forests should not be diminished but should be enlarged as rapidly as possible. The appropriation of a million dollars which Congress will apparently provide this year for the purchase of additional lands is altogether inadequate and should be increased to at least ten million dollars a year at the earliest opportunity. In this connection it is interesting to note that Washington's sister State, Oregon, which contains the largest area of

standing timber in the United States, "recognizes the desirability of maintaining the present National Forests under Federal control and believes in the blocking out, with certain limitations, of federal forest areas by purchase or otherwise of absolute forest land in the interest of more efficient and economical management of existing forests." Increased acquisition of forest lands by the Federal Government, particularly in the eastern United States, is sound public policy and should be pushed vigorously and without delay.

INDIANA CONSIDERS NEW FORESTRY LEGISLATION

THE General Assembly of Indiana now has before it two measures drawn by the Department of Conservation and aimed at protecting and increasing the forest resources of the State. The adoption of the first of these measures, dealing with the protection of farm and forest lands from fire, would constitute a marked advance over present practice. In brief, the bill proposes to centralize fire protection under the State Fire Marshal, acting *ex officio* as chief farm and forest fire warden, with the assistance of township wardens appointed by the county commissioners but subject to his approval. The State Forester is created *ex officio* assistant farm and forest fire warden and is given jurisdiction over all State forests, with authority to appoint as many assistant wardens as in his judgment are necessary to protect the State Forests and State Parks from fire. Inasmuch as Indiana's State Forests and State Parks are not at present extensive, the great bulk of the fire protective work is thus placed in the hands of the State Fire Marshal. This proposal constitutes a distinct departure from the practice in most other States, where fire protection for all classes of forest land, both public and private, is ordinarily centered in the State Forester. There are, however, certain advantages in relieving the State Forester of this burden, and the practical working out of the Indiana plan will doubtless be watched with much interest by other States should it be adopted.

Several sections of the bill are designed to put sufficient "teeth" in it to make it really effective. Thus, all wardens are given authority to summon all male residents of the State between 18 and 50 years of age to assist in extinguishing fires, and to arrest without warrant violators of the law. Heavy penalties are provided for maliciously setting fires on either public or private land, and for letting fire escape from one's own land with consequent damage to another's property. Penalties are also provided for kindling fires on public land or along State highways without permission of the appropriate authority. This provision might well be applied to kindling fires on any lands within the dangerous season without a permit. Other slight modifications might also be suggested, but these do not affect the main features of the law, which is decidedly worthy of enactment.

The other measure proposes to encourage timber production by granting a virtual subsidy through the reduc-

tion of taxes. Owners of "forest plantations" and "native forest lands," which are defined in great detail, are permitted to have them classified and assessed at the uniform rate of \$1.00 per acre. This assessment can apparently be continued indefinitely, provided the management of the lands is satisfactory to the State Forester, and no provision is made for the collection of any products tax at time of cutting. An interesting and commendable feature of the bill is the proposal, when any land is withdrawn from classification, for the State to appropriate in the form of an unearned increment tax any appreciation that may have taken place in the value of the bare land during the period while it was under classification.

The present measure covers much the same ground as a somewhat similar law permitting the assessment of forest land at \$1.00 per acre which was passed in 1889, but was repealed after four years because it was so loosely drawn. There is perhaps some question as to whether the provisions of the new bill, in attempting to remedy these defects do not go to the other extreme and may not prove so cumbersome as to be unworkable. It would, for example, seem to be much easier and fully as effective to leave it to the State Forester to decide whether a given tract is sufficiently well stocked as to come within the terms of the law, rather than to prescribe a fixed minimum number of trees at each age, to credit trees of a given diameter as occupying so many square feet of ground, and to provide that "if a tree dies or is removed the vacancy shall be filled by planting seed or seedlings therein." It is also questionable whether it is either necessary or justifiable to grant timber growers so large a subsidy as is represented by a tax on a purely nominal land valuation and by complete exemption from any cutting tax. In most other States the tendency in forest taxation reform appears to be toward assessing the bare land at its fair market value, and collecting a products tax from the mature timber at time of cutting.

Fire protection and forest taxation constitute two of the important problems which must be solved in the development of any adequate State forest policy. It is to be hoped that the General Assembly of Indiana will not adjourn without taking advantage of the opportunity presented by these bills to take constructive action in this direction.

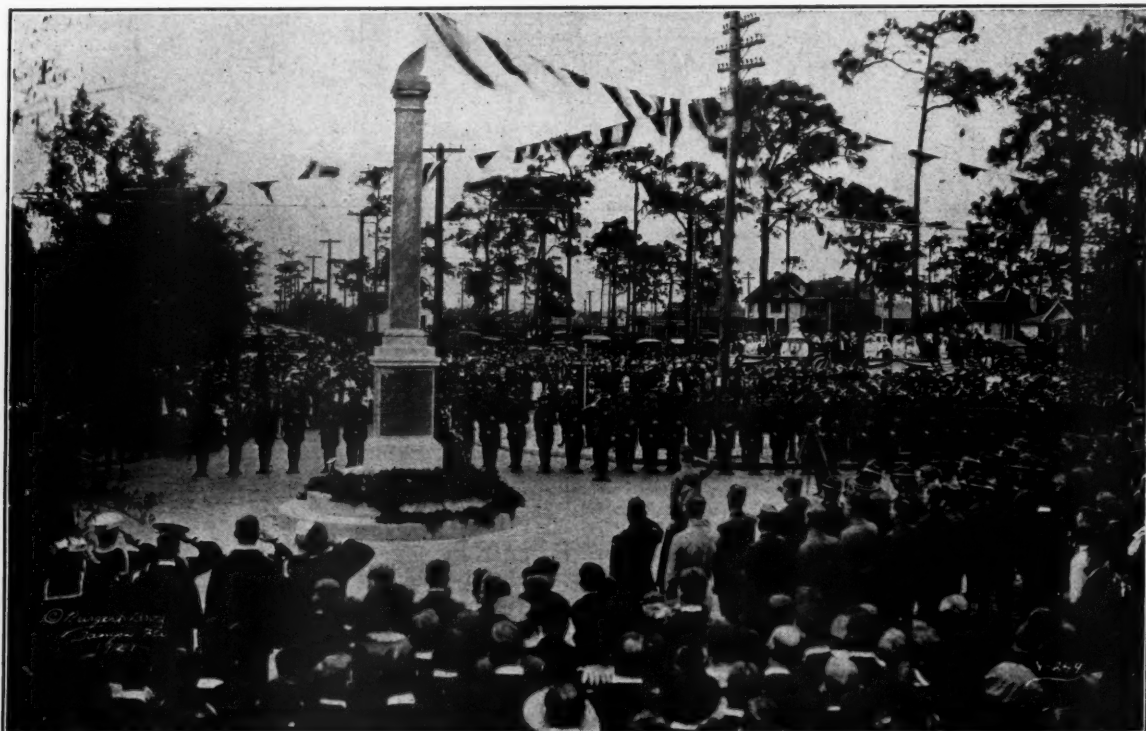
FIRST ROAD OF REMEMBRANCE DEDICATED

THE first Road of Remembrance has been dedicated at Tampa, Florida, to "Hillsborough County's 106."

The memorial highway is fifteen miles long and the undertaking was handled by the Rotary Club of Tampa. A fine shaft, marking the start of the road, was designed by Rotarian Ralph D. Martin. The speakers were E. D. Lambright and the Rev. E. C. Patillo, rector of St. Andrew's Episcopal Church, both Rotarians. The invocation was by the Rev. L. M. Broyles, of the Hyde Park Methodist Church. Secretary L. P. Dickie read the honor roll of those for whom trees have been planted as registered on the honor roll of memorial trees by the American Forestry Association. Commander J. B. Gay, of the Gunboat *Asheville*, spoke on behalf of the Navy. Lieutenant R. C. McDonald was in command of the planes from Carlstrom Field that patrolled the highway during the ceremony. A telegram from the American Forestry Association to the Rotarians said: "May those trees you dedicate on the first Road of Remembrance in the United States live as long as the memory of the '106' you so finely honor." Sergeant H. L. Smith, of Fort Dade, and Chief Gunner's Mate F. J. Burrows, of the Gunboat *Asheville*, pulled the ropes that freed the American Flag about the shaft. Hillsborough's Gold Star Mothers witnessed the ceremony, on January 2. President T. F. Alexander, of the Rotary Club, presided, and Rotarian J. G. Yates has the honor of being the first to suggest the Road of Remembrance plan to the Rotary Club.

This is an example of the plans afoot in many places.

The Lincoln Highway Memorial Association has large visioned tree planting plans going. The American Forestry Association's suggestion that the Roosevelt Memorial Highway be made a Road of Remembrance met with instant response. In Ohio Mrs. William D. Caldwell and Mrs. Edith F. March, of Canton, have worked out plans for memorial tree planting by the General Federation of Women's Clubs in that State. They have registered many of the trees in Stark County on the Association's honor roll. The Lincoln Highway has been projected for some years but the vision of the parked environs which had been developed by Jens Jensen took vital hold of and dominated the minds of the group of Canton women and they resolved to help make it materialize. In 1919 they banded together to carry forward the work. Twenty-six clubs were represented in the new one, under Mrs. Caldwell's leadership, and the name chosen was the Lincoln Highway Memorial Association of Stark County, Ohio. The general aim is to follow the Jensen suggestions and to promote planting the ground on both sides of the Lincoln Way along the thirty-five miles of its extent through Stark County. Professor R. B. Cruickshank, of the Horticultural Department of the Ohio State University, and Mr. Secrest, of the Government Experimental Station, at Wooster, Ohio, lent co-operation and in less than a year a thousand memberships were taken by men, women, and children; blue prints were made; thirty trees planted, and markers placed.



Photograph by Burgert Brothers.

IMPRESSIVE CEREMONIES ATTENDED THE DEDICATION BY THE ROTARY CLUB OF TAMPA OF THE MEMORIAL HIGHWAY, FIFTEEN MILES LONG—THE FIRST "ROAD OF REMEMBRANCE," AT TAMPA, FLORIDA

SPAIN AND HER SCANTY FORESTS

BY NELSON COURTLANDT BROWN

(PHOTOGRAPHS BY THE AUTHOR)

THE casual traveler from this country in Spain is at once impressed with the bold and barren character of the landscape as presented to him at every turn, and which immediately strikes one as being almost forbidding in its exceeding austerity and barrenness, especially to one accustomed to seeing the landscape clothed, at least in part, with a wooded cover. The treelessness of a large portion of the country is perhaps the most outstanding feature of the visitor's first impression of the "land of the Don." From the viewpoint of topography, Spain, next to Switzerland, is probably the most mountainous country in all Europe, and consists largely of high plateaux about 2000 feet or more in elevation, interspersed with high mountain ranges which also surround the plateaux on all sides, and which drop off with striking abruptness to the sea. It should, therefore, under normal circumstances, be one of the most heavily forested countries in Europe, whereas it is probably one of the most scantily covered sections to be found anywhere, with the possible exception of China and Greece. One naturally associates forests with mountains, and the effect upon one accustomed to well forested mountain slopes is most impressive. In many parts of Spain one can frequently travel for many miles through the mountainous districts without seeing any trees at all.

It is very likely that this condition has not always been the case in Spain, for there are

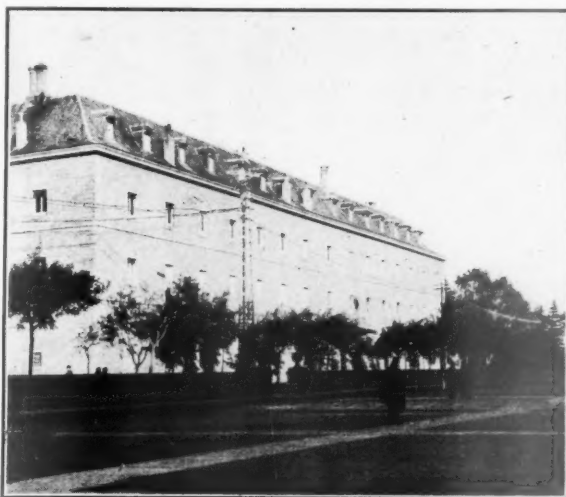
evidences that the mountainous sections, at least, were well forested at one time. It is very probable, however, that ever since the time the stalwart Roman legions

conquered the country before the time of Caesar, the whole Iberian peninsula has gradually lost most of its forests through continuous warfare, political dissensions, and internal strife. After the Romans conquered the country, it was variously visited by the Frankish, the Ostrogothic and many other hordes from the north and the Moors from the south. After the expulsion of the Moors had been completed by Ferdinand and Isabella, just prior to the discovery of this country by Columbus in 1492, Spain rose to its highest ascendancy in the sixteenth century under the powerful regimes of

Charles V and his successor, Henry II, but from that time on gradually diminished in its international influence and has neglected many of its most important internal problems and resources. Well

forested mountains once covered with trees were frequently left to burn over from time to time after cutting and now serve only as inferior pasture land.

It was not until April 30, 1835, that any material progress was made in favor of the preservation and the extension of the Spanish forests. Spanish forestry really dates from that time. A special forestry bureau was established by the king then, and a few years later, in 1848, there was inaugurated a special Royal School of Forestry, called in



SPANISH COLLEGE OF FORESTRY

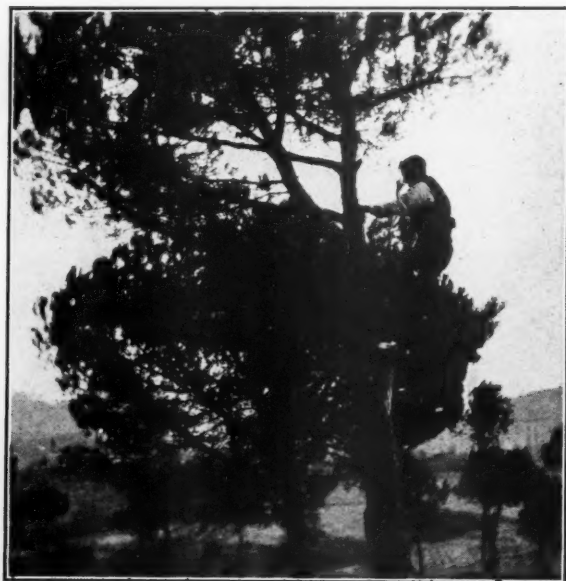
The Royal Spanish Forestry College at El Escorial, in the Guadarrama Mountains, overlooking the high Castilian plateau. This is entirely supported by the government and has been in existence for over 50 years. It is now used for a summer headquarters, the principal part of the college year being offered in Madrid.



A SPANISH FOREST

A view in a Spanish forest. Although some of the stands are much better than shown here, this probably represents a typical forest of pine. Owing to the serious fuel problem many immature and young growing forests have been cut for fuel wood. With the importation of normal lumber supplies nearly eliminated almost every native forest has been cut over in an effort to compensate for this shortage. Spain has even sent cross ties and lumber to France for the allied armies during the war.

Spanish, "La Escuela Especial de Ingenieros de Montes," which was established at Villaviciosa de Odon. This school is still in operation, but was moved to San Lorenzo del Escorial in the Guadarrama Mountains, north of Madrid. The credit for the establishment of a well organized forest service, and the creation of a greater interest of both a public and private character in the future of Spanish forests belongs to King Alfonso XII, father of the present King, who reigned from 1873 to 1885, and who made forestry his particular avocation. He studied and followed the profession to considerable length when in Austria. He named the technical staff



CUTTING BRANCHES FOR FUEL

Trimming limb wood from maritime pine trees on the outskirts of the city of Sarria in the vicinity of Barcelona. Although these trees were not cut, their limbs were almost completely stripped off, so urgent was the demand for fuel wood. Many industries formerly using coal were compelled to resort to fuel wood during the war.

and personnel to scientifically manage the Spanish forests of Balsain, the ancient hereditary domain belonging to the Spanish crown for the past several centuries. This was located in the extensive pine forests on the north slope of the Guadarrama Mountains, near Segovia—one of the few bright spots in a region of brown and barren mountains. The Forest of Balsain is now visited frequently by those interested in Spanish forestry practice, and it has more recently become the center of production of some of the very best Spanish timber. During the recent war, the most extensive timber operations in Spain were conducted on this ancient crown forest, and it helped very materially to supply a part of the deficiency of material owing to the lack of imports of forest products during the war. During the year 1918, this forest produced about 700,000 board feet—a large operation for Spain, but an extremely small one for this country.

Forestry in Spain probably follows more along aesthetic lines than that of any other country, a good share of the professional interest being devoted to the

proper care of and attention to shade trees along the city streets and country highways, as well as the development and maintenance of beautiful parks, some of which are very famous. Splendid evidence of this phase of Spanish forestry is everywhere present in the excellent care given to the shade trees along the city streets and parkways, particularly in such well known boulevards as the Prado in Madrid, the Paseo de Gracia in Barcelona, and the Paseo and Parkway in Seville.

Owing to torrential rains common in the high mountains and the consequent destruction resulting from erosion, the Spanish forestry officials have also devoted a considerable part of their attention to the erosion problem. As in the Vosges region of France, and in Switzerland the first efforts have been in the construction of dams to impede the runoff. This is followed in so far as funds are available by reforestation on the mountain slopes most susceptible to erosion. Some excellent results have already been obtained in the Pyrenees Mountains.

A great deal of attention is also given to fish and game culture along with their forestry practice. This



TREES STRIPPED OF BRANCHES FOR FUEL

This illustrates in a forcible way the need for fuel wood in Spain. All of these maritime pine trees have been stripped of their branches nearly to the tops to provide fuel. Spain produces practically no coal and with the importation shut off, prices for fuel wood have risen from 100 per cent to 200 per cent or more above the pre-war price level.

was initiated in 1886 when the Madrid Government leased the monastery of Piedra and established there the first fish hatchery.

The Spanish forests consist very largely of pine and oak. These are found chiefly in the Pyrenees and the Cantabrian Range, which is a western continuation of the Pyrenees and which borders closely the northern coast of Spain. In the south, are the highest mountains of the whole country, the Sierra Nevadas, near Granada, which attain an elevation of 11,400 feet, and are snow capped a good portion of the year. On the very highest

parts of these mountains may be seen a little silver fir, but the oak and pine constitute a large share of the forest wherever it is present. Most of the best pine is found in the province of Galicia and consists of the same maritime pine which is found in the Landes region of southwestern France. From the Galician forests come considerable quantities of pit props, which are exported in normal times in considerable quantities to England in return for the much needed coal on which Spain is almost entirely dependent. In Catalonia, above Barcelona, and in Andalusia, of Southern Spain—the real Spain of the story books—are found the extensive cork oak forests which produce a good share of the world's supply of cork.

In order to promote the best interests of the forests of Spain, a Spanish Forestry Association was formed many years ago, and is very active. An excellent monthly publication is issued at the headquarters in Madrid, entitled *Espana Forestal*. It is very attractively printed and beautifully illustrated and contains interesting articles on all phases of the subject, but it is noticed that many articles are designed to encourage greater government support of the forestry program, and to encourage the

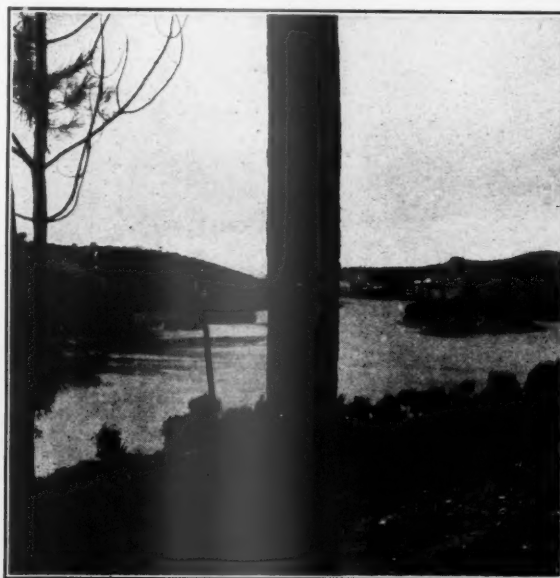
In traveling about Spain, one is immediately impressed by the large number of trees indigenous to this country which have been planted successfully in nearly all parts of the Spanish peninsula. The California redwoods are to be seen growing in public parks in all parts of the country; they are used at railway stations and about country villas and private estates. In the grounds of the palace of the old Spanish kings at El Escorial are several redwoods about 65 years old which are from three to four feet in diameter and they apparently grow as well as in their native habitat in California. Eucalyptus trees are also found planted throughout Spain, and they are as



SYCAMORES IN SPAIN

Method of trimming street trees employed in the city of Sarria in the Province of Catalonia. These are sycamore trees which are the principal street trees of Spain. The European linden is also used to some extent.

appropriation of larger funds for the purpose. Many articles are also devoted to commercial information, particularly with regard to the kinds and prices of lumber and other forest products from the different sections of the country. Since Spain is the home of the cork oak, considerable interest is evinced in the proper care and protection of these forests. They are an important source of income to the country at large, and many of the largest estates are dependent for their income upon the extensive cork oak forests which have been largely held within the same families and been operated along similar lines for the past several centuries.



TAGUS BORDERED BY TREES

A view down the well-known Tagus River which flows from the high interior plateau of Central Spain, westward past the old historic city of Toledo, and across Portugal to the Atlantic, at the port of Lisbon. The island shown on the right is an old Roman fortress which is still in an excellent state of preservation. Almost along its entire course, the river is bordered by the picturesque pine or cork oak forests and occasional olive groves and vineyards.

common a sight in the landscape in and about the large cities as they are in southern California.

For reforestation, the European poplar is used extensively in the lower valleys, where this tree has been widely planted for the purpose of producing pulp wood. Along the railway lines between Barcelona and the Spanish frontier at Cerbere are to be seen extensive plantations of poplars which are apparently doing splendidly. For plantations in the mountains, the maritime pine is a favorite. Eucalyptus trees are planted for decorative purposes, for windbreaks, and for cordwood and timbers. Some of the prominent mines near Huelva plant them for mine props and cross-ties and report very successful results.

The total area of forests of all kinds in Spain amount to about 62,000,000 acres. According to the officials of the Government Forestry Service at Madrid, this includes, however, a large area of low brush wood and mountain pasture land which we should scarcely classify



STREET TREE PLANTING IN SPAIN

A view on one of the principal streets of Barcelona showing the well-trimmed character of their shade trees, which in this case are of sycamore. The two-wheeled carts shown in this picture are a characteristic sight on all Spanish highways.

as forests in this country. It is not likely that Spain contains over 12,000,000 acres of forest which we should classify as such in this country. Of this total area practically three-fourths belong to private interests, and only a little less than one-fourth belongs to municipal forests, the remainder amounting to a little over 600,000 acres, are owned and controlled by the central government at Madrid. State forestry is under the jurisdiction of the Ministry of Development and is directly under the



LOADS OF WOOD FOR FUEL

A common sight on the streets of Seville in southern Spain. Great quantities of branches and fuel wood were brought in from surrounding forests for use not only for domestic purposes, but for industrial plants as well. Wood is even used in many of the locomotives and was the principal fuel used for heating throughout Spain during the war, owing to the scarcity of imported coal which normally comes from England.

Director General of Agriculture, Mines and Forests. The faculty of the Royal Forestry College also acts as officers of the Forest Service. A few forests, amounting to about 15,000 acres belong to the church and to individual monasteries and to other secular interests.

There is a strong movement under way to encourage the appropriation of more funds with which to extend the areas of the National Forests, for only in this way can forestry be encouraged and developed on any comprehensive scale. Forestry officials at Madrid estimate that instead of having only about 10 per cent of the area of the country included in real forests as at present, at least 30 per cent should be well forested.

Some privately owned forests are managed on conservative forestry principles and receive careful protection, but a large majority of them have suffered from over-cutting, and later deteriorated through ravages of



PRIMITIVE WOOD-SAWING METHODS

Primitive methods of sawing are still occasionally employed in Spain. Many features of the lumber industry are still in a very elementary and primitive stage of development as compared with conditions in this country. Manual labor is resorted to in most of the wood-working establishments to a much greater extent than is commonly found in this country.

fires and the intensive grazing of herds of sheep and goats. Another serious menace to the development of forests in Spain is the severe cutting for charcoal and fuel wood before the trees have attained a fair size. The curling smoke rising from charcoal pits is a common sight in all Spanish forested mountain districts. Frequently trees which have attained a diameter of from five to eight inches are cut and used for charcoal, whereas they should be left to reach a much larger size. The recent world's war has even intensified the situation, because Spain is practically without coal, and therefore largely dependent upon England for her imports. It naturally follows, therefore, that Spain was compelled to resort to her native forests to compensate for the shortage of imported coal for a period of over four years.

Instead of coal selling for from \$10 to \$15 per ton, which was the normal price before the war, it finally reached the extremely high price of from \$80 to \$180 per ton, according to quality. This has meant that only certain specialized industries and some of the railways could afford to use coal. Most of the industries, as well as homes were dependent upon firewood or charcoal for their fuel, with the resultant heavy cutting of all the most accessible and available forests. It was a common sight to see fuel wood selling for from \$20 to \$30 per cord or more in many Spanish cities. Even branches and the smallest brush and twigs were collected and utilized for fuel.

Spain has always been a very important importer of lumber and forest products, but with the outbreak of the war there was insufficient tonnage to bring material to Spain, and its local forests were compelled to supply at least a portion of the serious shortage. As a result, the already neglected forests have been most seriously sacrificed for fuelwood as well as lumber and have

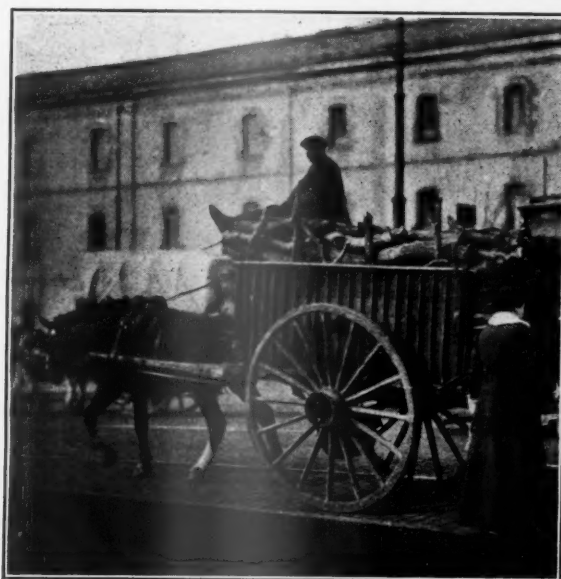


REDWOODS IN SPAIN

California redwoods about 36 inches in diameter at the base, growing in the gardens of the old royal palace of the Spanish kings at El Escorial in the Guadarrama Mountains north of Madrid. California redwoods are commonly found planted throughout Spain and there are many trees from two to three feet in diameter, indicating that these trees were planted from 50 to 80 years ago or more. They grow splendidly under the climatic and soil conditions afforded in Spain.

received a set-back from which they will require from fifteen to thirty years or more to recover. Although an important importer of wood, Spain was, however, called upon to supply cross-ties and other forest products for the American and French armies in France. In spite of a virulent and wide spread propaganda carried on by 100,000 Germans who had drifted to Spain from various countries at the outbreak of the war, Spain contributed many materials that were of real assistance to the allied armies in France. Although officially neutral, the senti-

ment in Spain was pronouncedly pro-German. This feeling was no doubt due to the active work of the German propagandists. The movement of civilians across the frontier to and from France was constantly watched with the most painstaking scrutiny. In January, 1918, about \$50,000 worth of materials were purchased for the American army in Spain. It was considered a good sized shipment from Spain, but by September, 1918, over \$10,000,000 worth was being purchased for the support and maintenance of our army alone in France. Over



CORDWOOD AT \$30 A CORD

A familiar sight on the streets of Barcelona when fuelwood was in great demand, owing to the lack of normal supplies from England. Cordwood brought as high as \$20 to \$30 per cord or more, delivered in Barcelona, and coal was selling at the prohibitively high price of between \$80 and \$160 per ton.

400,000 cross-ties were contracted for, and had the war continued, preparations were being made for the purchase of many more cross-ties, lumber and other materials. Pine and oak cross-ties were from \$2.00 to \$2.50 apiece, depending upon quality and size.

With the heavy purchase of food, forest products, and other materials for the allied armies, Spain prospered as seldom before, and now it is believed that Spain will engage in many larger policies of national welfare and developments of her important and largely latent agricultural and mining resources. In this wave of better things—a rebirth of the old Spanish position in world's affairs, the friends and supporters of forestry in Spain are hopeful of a better and more comprehensive plan of forest conservation which will insure the future of the Spanish forests. A notable forward step was taken in June, 1913, when the Royal Spanish Society of the Friends of the Forest was established under the royal patronage of His Majesty King Alfonso XIII and the Queen Mother Victoria Eugenia. This organization has been recognized by royal decree as being of great general public welfare.

FOREST RECREATION DEPARTMENT

NATURE—STONE-MASON AND ARCHITECT

ARTHUR H. CARHART, EDITOR

SCENIC ODDITIES IN AND NEAR LA SAL NATIONAL FOREST

BY CHARLES DEMOISY, JR., SUPERVISOR OF LA SAL NATIONAL FOREST

TO the tourist, recreationist, geologist, or student in archæology, an excellent opportunity for viewing and studying some of the most sublime and grotesque scenic and geologic wonders of the United States, is offered in the region of the La Sal National Forest and the Natural Bridges National Monument in San Juan County, Utah. This area, heretofore visited by comparatively few, mostly local ranchers and stockmen and pioneer geologists and archæologists, also offers opportunity to the adventurous for exploring a wild, undeveloped country showing, as yet, little evidence of man's dominion.

In the extreme southeastern part of the State, the native sand rock has been carved by the great sculptural



THE EDWIN NATURAL BRIDGE

At once sublime and grotesque the natural bridge presents both beauty and engrossing problems in geology. The magnitude of the arch is well shown here in contrast to the human figures standing on top of it. Nature, by wind and water action has here builded a monument to her forces equal to many man-made structures of the same type and by far more graceful than most bridges.

forces of wind and stream erosion into strange, fantastic shapes leaving a myriad of benches, canyons, peaks and pinnacles, cliffs and chasms, in perfect miniature of that wonder of wonders in scenic interest, the Grand Canyon of the Colorado, to which the drainage of this country is tributary.

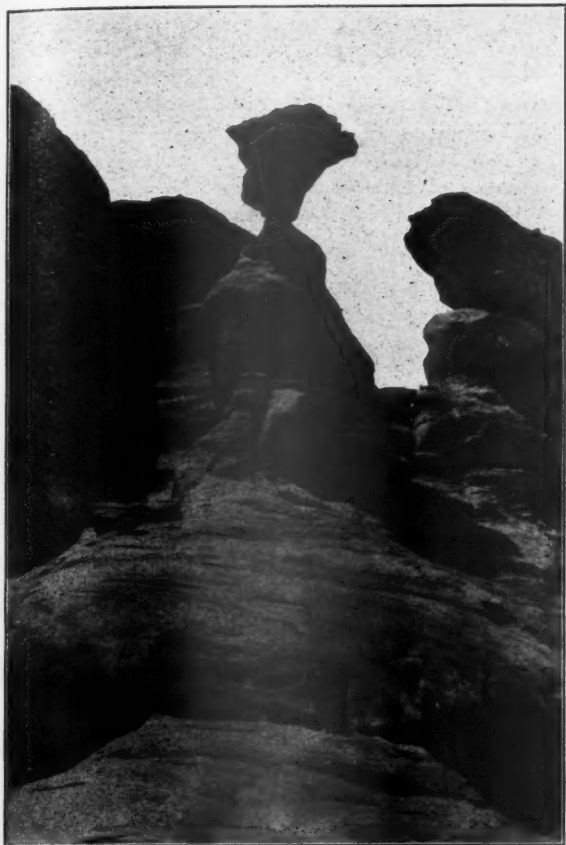
Outstanding instances of this strange work of Nature are "Big Indian," "Church Rock," "Looking Glass" rock, typifying in minutest detail the objects to which their names

refer; the picturesque "Ship Rock," near where four State corners meet, standing out like an ancient sailing vessel on the ocean horizon; the Bear's Ears, freakish shaped mountains and famous landmarks, and, by far the most interesting scenic attractions of the entire section,

If all our National Forests could be heard from, few could offer more unusual scenic attractions than those found in and near the La Sal. Mr. Demoisy graphically tells of a few of the unusual bits of landscape to be found there. And yet, if we could only get like information from nearly any National Forest we would find that in each can be found some striking thing worth seeing.

To know your National Forests is to become familiar with the greater values of scenic America. The 150,000,000 acres of National Forest territory are not all replete with scenic wonders and yet every one of them carries some charm. The aggregate scenic wealth within these Forests is one of the greatest aesthetic heritages ever owned by a nation.

Knowing the La Sal you know but one of the more than one hundred and fifty National Forests. But in thus meeting the La Sal National Forest as here presented you become familiar with one more of the scenic wonderlands of the Forests and thus may come so much closer to knowing the majority of these stupendous lands of scenic surprises and unexcelled vacation lands.—Arthur H. Carhart, Editor, Recreation Department.



BALANCED ROCK

At the head of Nigger Bill Canyon, Northern Division of the La Sal National Forest, is this queer member of the Balanced Rock Family. As a background is seen one of the multitude of wind-fretted rock cliffs of the region.

the Natural Bridges, three of them within a short distance of each other, being included in a National Monument.

These three natural bridges, and the great Rainbow Bridge, several miles to the westward, are easily the largest yet discovered in the United States. The first three are within a distance of five miles and are called "Edwin," "Caroline" and "Augusta," in the order in which they are usually approached. Later names assigned to them by officials of the United States Land Office, but not generally used, are, respectively, Owachomo, Kachina and Sipapu—Hopi Indian names.

Sloping as the country does, from the higher peaks of the Blue Mountains, where 12,000 feet elevation is attained, to the low level of the Colorado River, it is not hard to imagine the cutting and polishing forces of the currents of mountain waters as they rushed through the irregular cracks and crevices in surging eddies. In this manner sharp corners were rounded off, deep caverns and recesses were dug out of the cliffs, and soft places in the yielding sandstone were

sought out. This process continued so long that a series of perfectly formed buttresses and arches is left, having particularly graceful curves and pleasing proportions.

The "Edwin" bridge is a slender and delicately proportioned structure, particularly pleasing to the eye. It has a span of 194 feet and a height of 108 feet. The long arch is only ten feet thick in the center and thirty feet wide across the top.

Approximately three miles down the canyon near the junction of White and Armstrong Canyons, is found the "Caroline," having a more massive and less well finished arch than the former, but none the less imposing. So large are the parts of this bridge and so close the surrounding walls and cliffs that the successful photographing of it presents a difficult problem. Its span is 186 feet from side to side and 98 feet high in the center. The total height of the bridge is 205 feet with a width on top of 49 feet. Beneath this great structure is a cool, clear spring of water, inviting the traveler to refresh himself and rest in the majestic splendor of the situation.

Proceeding up White Canyon, whose lofty cliffs, domes and caverns become more and more impressive, one approaches the great "Augusta" bridge, the span of which is 157 feet high and 261 feet long. The total height is 222 feet and the width at the top is 28 feet. It is a fitting climax to this series of natural wonders, combining massiveness with gracefulness of proportions in an unbelievable manner.

The crowning glory of the scenic attractions is their coloring. The rock formation is a sandstone of rich red



MRS. UTE SQUAW AND FAMILY

While along the sides of the many canyons of this land of mystery are ruins of pre-historic cliff-dwellers, in other places may be seen members of Indian tribes whose reservations are nearby. These later Americans are not a bit less interesting than the ruins which speak mutely of a very early civilization.

or brown color with the top or exposed portions white or gray due to the weathering influences. Between these two are found every shade or tint in striking combinations that do not seem real. This picturesque effect delightfully breaks up the usual monotony of the desert and canyon types of scenery. Such plants as cacti, yucca, greasewood, and sagebrush abound in the lower levels. Above these are found immense bodies of Pinon and Juniper, topped with tall pine and spruce timber, interspersed with cool aspen groves and crystal springs, as the mountain tops are approached.

In the many natural caves and sheltered ledges of the cliffs within the National Monument and along the trail en route, are found the ruins of cliff dwellers' houses. There are also on the massive side walls ancient paintings and hieroglyphics—mute evidence of a civilization which is lost to history. The exploration of these rewards the visitor bounteously in adventure, and information.

From Monticello or Blanding, Utah, which is easily reached by auto from southern Colorado or central and eastern Utah points, the only means of transportation today is by saddle-horse and pack outfit. To anyone used to active outdoor recreation, the 40 to 50 mile trip is not a strenuous one, if taken any time during or between the months of May and November. Its length can be broken by any number of camps en route, rich in scenic attractions and unusual interest. During most

of the winter months the Bridges are also accessible but the temperature at that time is a little too low for comfort. Plans are under way for the construction of a good auto road to the region, but, owing to the cost and difficulty of providing sufficient funds, it will undoubtedly be two or three years before this becomes a reality.

Parties contemplating one of these trips should be accompanied by a guide as a knowledge of desirable camping places near good water is essential and a

stranger might easily and hopelessly be lost in the maze of box canyons and ridges with precipitous slopes. Competent guides and good outfits can be readily arranged for in the towns of Blanding and Monticello. To avoid delay these arrangements should ordinarily be completed in advance.

Recently a commercial aircraft company has been investigating possi-

bly landing and camping places near the Bridges with a view of making air excursions thereto from railroad points and surrounding centers of population. It is confidently predicted that this mode of transportation will become popular within a few years with many visitors.

In the meantime those who are interested need not wait for better facilities of travel to be perfected and lose the exhilaration and satisfaction that this trip affords now, as well as the distinction of being among the first to explore this wild and comparatively little known region.



THE AUGUSTA NATURAL BRIDGE

Carving and coloring, done by the master hand of nature and softened by years and years of exposure to the weather make these natural bridges more than freaks of nature. They are things of beauty.

HISTORIC OAK DESTROYED

ONE of Talbot County's historical trees was destroyed recently by a storm, says an Easton, Maryland, dispatch to the Baltimore Star. The mammoth white oak in the rear of the brick meeting-house of the Society of Friends, known as Third Haven Meeting-house, fell with a crash and made kindling wood of 50 feet of shedding, where the members were wont to hitch their horses and teams when attending service. This tree was one of the original grove under which William Penn

preached when touring Maryland and where Lord Baltimore at one time worshipped. During the last 40 years a half dozen of these monsters have gone. The stumps of two of them disclosed more than 400 rings. The monarch of the group still stands. Under this group of trees Indians took shelter in Colonial days. A place of worship was selected among them because of their protection, and the spot being a sanctuary in turn protected the trees.

LANDSCAPE ARCHITECTURE IN THE FORESTS

BY FRANK A. WAUGH

THE biggest problems which the profession of landscape architecture ever faced in the world are those which present themselves now in the National Parks and National Forests of North America, meaning the United States and Canada. Here we have given into our keeping the greatest stretches of the finest landscape ever made. Any suggestion for planting a tree here or a bush there or grading down a little hillock is so ridiculous that persons who think this to be the sole business of the landscape architect are inclined to laugh him out of court.

However, if the landscape architect is a real man and really understands his business he must know something more than the ordinary man knows about the landscape. Whatever special training he has and whatever extra development of taste or feeling, he ought to be able to apply these to some effect in dealing with the big landscapes which are so passionately loved by all Americans.

As a matter of fact the landscape architect has a very definite program in his mind with reference to these very problems. We may say briefly and positively that the business of the professional landscape architect with reference to these major landscapes is—

1. To preserve them in perpetuity.
2. To make them accessible to human beings.
3. To interpret the landscape to human understanding and feeling.

Now the work of conservation is sufficiently obvious. In setting aside national parks and national monuments the sole intention has usually been to preserve extraordinary landscape features for general enjoyment.

While this idea of landscape conservation has never been put forward in connection with the National Forests, the result of establishing such forests has been the conservation of much noble landscape on a very large scale. In state parks and state forests the same sort of conservation is going on, and this movement is progressing more rapidly than most persons imagine.

It is rather interesting to note therefore that the great conservation movement which received so much public attention a few years ago has almost unconsciously included an enormously extended and enormously valuable conservation of natural landscape.

The problems of making this landscape accessible are primarily those of technical landscape architecture. It is the regular business of the professional landscape architect to provide "circulation,"—the road paths and other methods of getting through and into the scenery.

This problem of circulation is much more difficult than has commonly been supposed. Thus far it has been approached mainly from the engineering standpoint. It must be clear, however, that if the problem is to develop the landscape to its best effect one must first of all have a very clear idea of the rela-

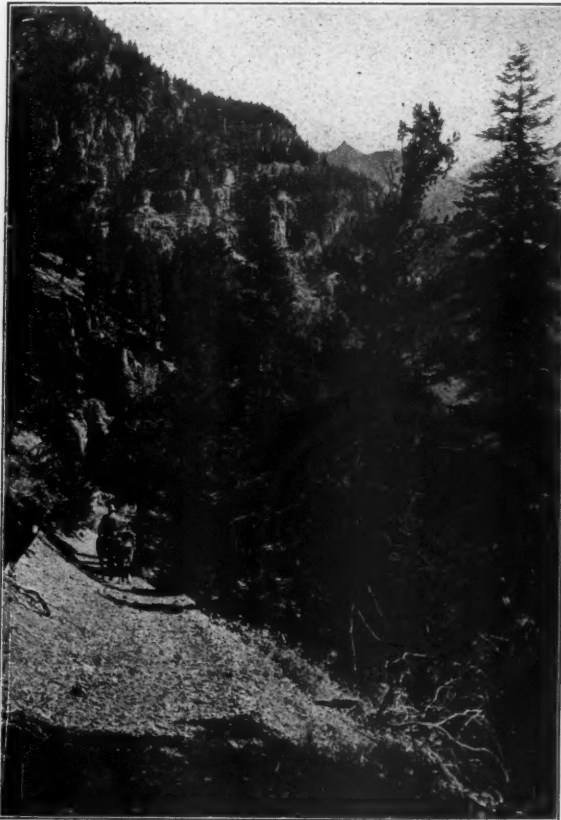
tive values of different parts of the landscape and of the artistic relation of part to part. The different features in the landscape must be presented in a coherent manner and in a logical order. Just for example, one frequently finds that circulation has been arranged in a manner to provide an artistic anti-climax.

Only the most meager hints can here be given regarding the character of these artistic problems, but it must



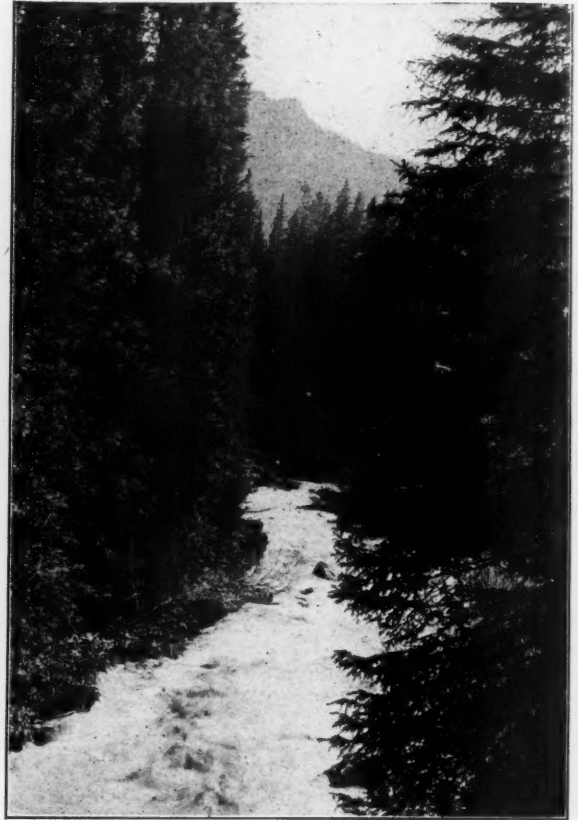
SNOWMASS PEAK AND LAKE

We may say positively that the business of the professional landscape architect with reference to these major landscapes is (1) to preserve them in perpetuity, (2) to make them accessible to human beings and (3) to interpret the landscape to human understanding and feeling.



A FOREST TRAIL ADMITTING OF FINE DEVELOPMENT

This trail at this point presents a problem in the art of landscape design. The question is, should there be a vista opened on the right to some point in the valley or is the mountain side in front the proper theme for this outlook.



IN THE WHITE RIVER NATIONAL FOREST, NEAR TRAPPERS LAKE

It is rather interesting to note that the great conservation movement which received so much public attention a few years ago has almost unconsciously included an extended and enormously valuable conservation of natural landscape.

More and better planning is needed in landscape development of National, State and County parks, monuments, forests and other like public lands. Too often the landscape development of such areas is either incidental work for some man already busy in other lines or is given into the hands of some one incompetent and incapable of developing the greatest art values in these regions. Public laws govern the practice of medicine, of law and other professions. It is as criminal to allow malpractice in the field of landscape work as in these other fields, and yet, because it does not touch pocket-book or health, the public does not demand swift condemnation of quackery so often foisted on the public as landscape gardening.

Landscape architects in charge of landscape design in our National, State and County playgrounds will give to the Nation through proper preservation and presentation of natural features present beauty values greater than can otherwise be realized. They will insure a working, living scheme which will have in it no lost motion due to ill-advised plans, and they will in this one item, in the long run, save the original cost of securing proper services. There will be no building of so-called rustic developments which are often merely grotesque or of monumental concrete structures in rural settings where they are not only out of taste, but represent a waste of valuable funds on inappropriate developments. Every step will be towards a unified composition and every part of the scheme will function as well (or perhaps better) fifty years hence as it will the day completed.

Landscape architecture is a fine art. In the field of greater landscape designing, so ably presented by Mr. Waugh in this article, that art can return to the people the greatest scenic wealth of the Nation, enhanced and protected, and furthermore, artistically and sympathetically presented to the public. What foolish economy it is to put money in on plans made by other than competent artists. What chances even those people who attempt to do landscape planning and are not properly trained or experienced, take in ruining some exquisite bit of natural beauty with ill-advised developments. Condemnation of such practice and the institution of a demand from everyone for the best treatment of the best American scenery should come at once. We owe it to ourselves, our neighbors and posterity. The article by Mr. Waugh but points the way to some of the greater possibilities in this work and where it will lead. It means if properly trained landscape architects be placed in this work there will be preservation, protection and artistic development of our great National play areas so that the country will be a land of enhanced natural beauty and not one of desecrated and dissipated scenic values lost because of ill-founded, over-zealous maltreatment of these values by someone serene in the belief that he is a "natural-born" landscape designer and artist. Such heaven-gifted spirits do no more grow spontaneously than do so originate great surgeons. Mr. Waugh has blazed the way and when that path is followed, the future is secure.—Arthur H. Carhart, Editor, Recreation Department.

be emphasized that up to the present moment the artistic possibilities of development in the natural landscape have been almost wholly neglected. Whenever some really effective development comes it must be expected at the hands of the men who know what landscape is and who, through rigorous training and experience have acquired the technical knowledge necessary for the solution of

such problems. Circulation is of course only one of the technical problems in landscape development, but it is typical of the sort of work which the professional landscape architect ought to be doing in all the territories now being conserved for human enjoyment.

Every artist of every sort has not only problems of structural design, but if he is a real artist he must also be capable of offering a spiritual interpretation of his work or of the work of other artists. Interpretation is entirely clear to us in many of the fine arts. We remember that Hamlet is a very different person when interpreted by Robert Mantell from the Hamlet of Salvini or Otis Skinner. Musical interpretation is a high form of musical art and even Beethoven's Fifth Symphony is by



UNITED STATES FOREST SERVICE REST CABIN—PIKE NATIONAL FOREST

Circulation is not the only problem for the landscape architect in the human use of the Forests. The housing problem or camp development is present too. Here at Timberline on Mount Evans the Service has built a tastily designed and serviceable house where one is welcome to stay over night. Inside are beds made of rough lumber, cooking utensils and tools bought and placed there by the Colorado Mountain Club, and by the door hangs a Service Traveler's register where each visitor is supposed to put down his name so the total visitors coming here in the season may be counted and added to the total for the Forest, State, or District.

sons of less training or insight. Quite obviously we are touching here on a matter of extreme difficulty. Yet landscape interpretation ought to be no more difficult than musical or dramatic interpretation. The main difficulty is that the idea is entirely new. It will take us some time yet to produce trained landscape interpreters and for them to find the most effective technique for this branch of the art of landscape architecture. To

some extent, however, the way has already been shown. John Burroughs has long been the unofficial interpreting naturalist of this country. The details of landscape—trees, flowers, birds—he has made seem more vivid, more human and more worthwhile. John Muir was the prophet of the larger phases of the land-



ON TRAPPERS LAKE

Any suggestion for planting a tree here or a bush there or grading down a little hillock is ridiculous. The landscape architect has a very definite program in his mind with reference to these larger problems.

scape. He made us love the mountains, the glaciers and the forests.

It might be suggested that these men were not landscape architects. It may be answered simply that the landscape architects ought to do that sort of thing also and do it better than anybody else. Any one who is at all acquainted with Mr. Jens Jensen, for instance, living and active landscape architect, president of his own



AUTO ROAD IN THE COLORADO NATIONAL FOREST

Traffic lines are either so developed as to tell the story of the country or they are monotonous. The aim of the landscape architect is to have a traffic line function not only as a line of travel, but tell a story in a pleasing way at the same time.

society of "Friends of Our Native Landscape," knows him as pre-eminently an interpreter. Moreover his interpretation is different, entirely characteristic, quite as individual as Stokowski's interpretation of Brahms. It may easily be described as a poetic mystical and symbolic interpretation.

Now these are large words in the field of landscape art, and I have not time now to explain or justify them. I only wish to point out that high, spiritual interpretations of the landscape are not so far away as we might think at first mention.

[Mr. Waugh is an authority on this subject. He has for two seasons studied recreation problems in the National Forests and playgrounds of the West. So he speaks with sympathetic and first-hand knowledge of this subject backed not alone by the study of theory but by the practical application of landscape design to these problems of national recreation territory.]

Most of all I want to emphasize the theorem with which I started, viz., that the landscape architect has a very definite work to perform in dealing with the big features of the native landscape, and that this work covers the whole field of conservation, technical development and interpretation.

THE SILVER BIRCH

Back from the highway, my lady of dreams

Murmurs a roundelay tender;

Silence and fragrance, and flowers and streams,

These do you sing of, my lady of dreams,

Standing so stately and slender.

Silvery white where the lone shadows brood,

White where the starlight is streaming,

Silvery white through your virginal snood,

Silvery white through your veil and your blood—

You, with your singing and dreaming!

You, with a cloak of the loveliest green

Draping your warm whiteness over!

You, with the breath of the forest, I ween,

Mosses and briars with lilies between—

Haunts of the poet and lover!

Back from the highway, my lady of dreams

Murmurs a roundelay tender;

Silence and fragrance, and flowers and streams

These do you sing of, my lady of dreams,

Standing so white and so slender!

—Jean Blewett, in London, Ontario, *Advertiser*.

BELGIAN GOVERNMENT ACKNOWLEDGES TREE SEED

FOLLOWING the shipment of seed sent to Belgium by the American Forestry Association for the replanting of areas devastated by the war, the Association has received the following letter from the Hon. N. P. Crahay, Director General of the Ministry of Agriculture of Belgium:

"I have the honor to advise you of the receipt of your letter of the 23rd of December announcing the shipment of the Douglas fir seed.

"The gift of your society is particularly valuable to us just at this time for the reforestation of the large area of denuded lands and because of the difficulty that we are experiencing in securing the seed of American species, of which the green variety of Douglas fir from Oregon is of the greatest interest from the point of view of Belgian silviculture.

"Please express my keen appreciation of the gift to the members of the American Forestry Association, and accept the assurance of my high consideration."

WOODCHUCKS AND PORCUPINES

BY R. W. SHUFELDT

(PHOTOGRAPHS BY THE AUTHOR AND OTHERS)

THE woodchucks we have in this country not only vary considerably in appearance and color, but their habits are likewise dissimilar owing to the difference in the environments in which they exist. I have had but little acquaintance with the northern and western forms of these animals, but abundant opportunity to study the eastern species in different sections of the New England and Middle States. Many years ago, during my boyhood days, which were mostly spent in



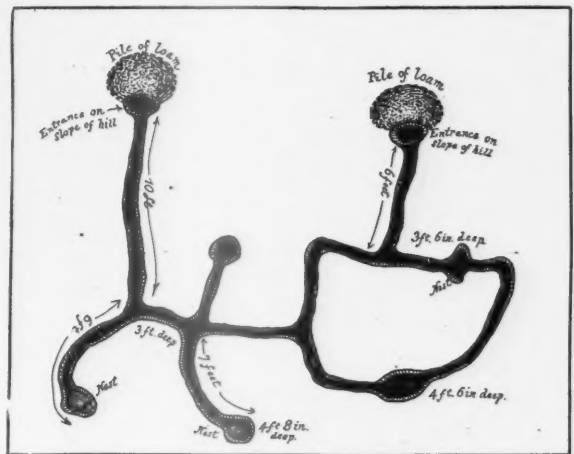
SOME CALL THIS THE GROUND HOG

Figure 1. An excellent picture of an old Woodchuck in a characteristic attitude. By the author from a drawing by Leon L. Pray, illustrating "The Mammals of Illinois and Wisconsin" by Charles B. Cory.

happy old New England, I did my share of both trapping and shooting woodchucks—even helping to eat a roasted one on occasions. But I did more than this, as I had them as pets several times, and closely studied their habits in nature and in confinement. In those days, in some parts of the State of Connecticut, it would be hard to pick out a clover field of any size that did not have a woodchuck burrow in some part of it. Sometimes the animal would choose a site somewhere under a stone wall surrounding a field; or, if there were a large rock anywhere about the middle of the field, he would burrow under this as a very choice location. Finally, the roots of an old apple or other tree would often be chosen for his stronghold, the burrow being dug down among them, as though its owner seemed to realize that no one would dream of attempting to dislodge him from such quarters.

As is the case with excavations made for their habitation by most fossorial mammals, the burrow of a

woodchuck at first descends obliquely into the earth; it then passes nearly horizontally for several feet, rises moderately for the last half of its length, to terminate in quite a spacious and round chamber which constitutes the "living-room" of the entire family. Here the female brings forth her litter, and here the young remain until they pair off and dig their own homes elsewhere. Such a burrow may be at least thirty feet in length—so long that one never dreams of digging a woodchuck out; but I have seen farmers bring up two or three barrels of water on a cart, and drown the occupants of this subterranean establishment at short notice, rejoicing most heartily if, in addition to the pair, seven or eight quarter-grown young were caught at the same time. I have often captured them in steel traps set at the mouth of the burrow, taking the precaution of covering it carefully with fine dirt. One old woodchuck had constructed his burrow almost in the exact center of a twenty-acre clover lot, and every attempt to



PLAN OF A WOODCHUCK'S BURROW

Figure 2. No existing quadruped can excel the Woodchuck in scientifically carrying out the scheme of a burrow; it fulfils all the necessary ends of an underground habitation.

capture him had utterly failed. It was the rarest thing to even catch him standing at the entrance to his burrow during the day, but just his head and shoulders might be frequently seen out of it. I must have fired at him twenty or thirty times from the other side of the stone wall that surrounded the field, and that with a heavy, old-fashioned, muzzle-loading Kentucky rifle, which, at seventy-five or hundred yards, was good nearly every time for small game. But every shot had failed. A cloud of dust would puff up at the very entrance to the burrow each time, and I would walk confidently over to pick him up; but no. Next day, at noon,



Courtesy of the United States Biological Survey.

THE YELLOW-BELLIED MARMOT

Figure 3. In this species the fur of the under parts is of a rich, golden yellow; and withal it is a very handsome animal. It is found in western Texas, New Mexico, Arizona, and northward.

there he was again, looking out as saucy as ever. I finally captured him by tying a Colt's revolver to a stout stake driven in the ground within a few feet of the burrow, and training the aim down the entrance. Then, attaching a long string to the trigger, I waited behind the wall till he again showed himself, when the success of the device sealed his doom. I found, upon examination, that he had been "barked" in several places by rifle balls, which included a long graze across one shoulder;



Courtesy of the New York Zoological Society.

AN EASTERN WOODCHUCK

Figure 5. Here again the Woodchuck investigates. This time he cannot see his shadow, and his attitude indicates that he catches the gentle air of settled spring time. He may now safely commence the work of the season.

the tip of his chin was gone, and his hair was parted along the top of his cranium.

Their heads make difficult shots at seventy-five yards owing to their color being so much like the earth about the burrow; and I have always believed that they succeed in dodging just a little bit at the flash. But this would probably be out of the question with the best of small calibre rifle nowadays. This woodchuck measured from tip to tip twenty-two inches, and was the largest specimen I ever examined; it was very dark in color, and, as a matter of fact, they vary a great deal in that way; I have shot some very light colored individuals—notably so for their under parts. The animal is never taken for its fur, though I have heard that its hide, in former times,



Courtesy of the New York Zoological Society.

EASTERN WOODCHUCK, THE "GROUND HOG"

Figure 4. If this be his first appearance above ground in the spring, he will surely have to go back into his burrow for another six weeks, as there is no question but that he can plainly "see his shadow." So much for myth-lore and rural tradition.

used to be cured for whip-lashes; but personally I have not known of their having been collected with the view of thus utilizing them.

Woodchucks are very prone to sit up on their haunches after the fashion of prairie marmots and spermophiles, and to eat with their fore feet while in this attitude. Farmers have, from the farmer's point of view, a good right to be their enemies, as not only do they eat up quantities of their clover, but tramp it down besides to no little extent. Then, during their foraging excursions at night—when they really venture away from their burrows for any distance—they consume and destroy quantities of young green corn and melons.

These animals become enormously fat during October in the Northern States, and take to the ground soon thereafter for a period of six months, during which time they enter into profound hibernation. They show no disposition whatever to live in companies like the marmots of the Western prairies; though, if I remember

correctly, their northwestern relatives, the hoary marmots, thus congregate—sometimes as many as thirty or forty being found in the same community. Woodchucks, when pressed, are very good runners, their squat appearance reminding one somewhat of a badger, and, like that animal, they will bite severely if captured by the hand. If cornered in a wall they will chatter and grunt, occasionally giving vent to a loud and peculiar whistle-like squeal, from which they get the name bestowed upon them by the Canadian French of *Siffleur*—the whistler. Upon several occasions I have seen woodchucks climb a tree, and if they can by so doing reach a large, horizontal limb, they will stretch themselves out upon it for a noon-day sun-bath.

Woodchucks are not nearly as numerous as they formerly were; though, notwithstanding the persistent war-



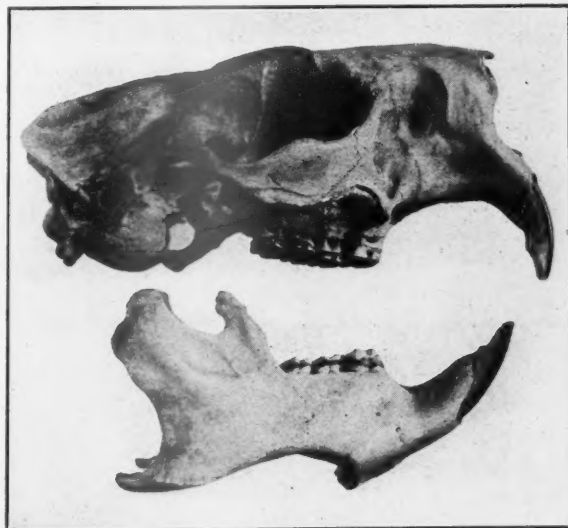
Courtesy of The University Society, Inc.

AS SNUG AS TWO BUGS IN A RUG

Figure 6. It is a well-known fact that the eastern Woodchuck occasionally hibernates in pairs. This remarkable photograph from life by S. A. Lottridge proves it.

fare against them by farmers and others, there seems to be no immediate danger of their total extermination. However, in some regions they have been entirely shot out.

Although it is an established fact that woodchucks will climb trees for various purposes, it will not come altogether amiss, I think, to offer some testimony here on this point. From this, as well as from my personal observation, I am convinced that these animals climb trees from a certain sciurine or squirrel propensity that at times impels them to do it; they climb trees for the pleasure of securing an elevated and unusual position in which to enjoy a sun-bath; they climb to obtain food, such as ripe peaches, of which they are very fond, and they will climb a tree when hotly pursued and badly frightened by an enemy, especially if the tree is convenient—one within their ability to ascend—and they have been cut off from reaching their burrows. I have never known a woodchuck to run up a tree in order to gain a higher point of observation than the ground



THE SKULL OF A PORCUPINE

Figure 7. Photograph by the author of a specimen loaned him by the United States National Museum. Jaw dissociated. Carefully compare with the skulls shown in Figure 8. Note the powerful incisor teeth, two in each jaw.

afforded him, when the approach of an enemy has been or is suspected, as squirrels so often do. A correspondent of Friendship, New York, wrote me a letter on the subject, in which he stated that "woodchucks do climb



SKULLS OF WOODCHUCK (upper) AND PORCUPINE COMPARED

Figure 8. Photographs by the author of specimens loaned by the United States National Museum. Dr. S. E. Hall collected the Woodchuck in New York State in 1856, and Mr. H. L. Barber the Porcupine in Fosterville, Wisconsin, in 1907. The teeth of these animals will bear careful study; note the functionless, disappearing anterior tooth in the upper jaw of the woodchuck.

trees, but only in rare instances; in over forty years' experience with them I have known of but two or three climbers. The first was discovered by several boys and myself, and this was up in a solitary, hard maple, about fifteen feet from the ground. This tree was in an open field, and at least one hundred yards from the nearest hole in the ground. It was about 12.30 P. M. of a chilly September day, when one would expect these animals to be safely under ground. It could not have been in the tree for a sun-bath, and we concluded that the woodchuck, which was a young one, was without a home of its own, and that we had surprised it in its wanderings, causing it to take refuge in the tree before we saw it. The other, a full-grown woodchuck, was treed by a dog—or at least found by the dog—in a large, soft maple tree, and at least twenty feet above the ground. The lower limbs, where the animal was found, were of small size, and so nearly vertical that the animal had to hang on for its life. I stoned it out of the tree, and noted that it seemed afraid to climb higher to get out of the way, and that it was very handy with its paws, grasping the limb as a coon does without using its claws. It must, however, have used its claws in climbing the tree."

Another correspondent, of Passaic, New Jersey, wrote me as follows: "One day, when I was a boy, my father told me that a neighbor's dog had a woodchuck treed in a small patch of woods, so I took my gun and shot it. It had climbed a straight hickory tree to the first branch, about eighteen feet from the ground. This tree was about eight inches in diameter at the butt, and stood perpendicular. The woodchuck was of medium size and not fat."

From Moosup, Connecticut, came another letter, and my correspondent stated in part: "In the year 1892 I shot 250 woodchucks. Of this number I got one from the top of quite a large apple tree that leaned about

45 degrees from the perpendicular. In an experience of more than thirty years, that is the only one I ever saw in a tree."

Stone and Cram, in their "American Animals," say: "The woodchuck is, perhaps, the least industrious animal in existence, except when engaged in digging his hole, when he works away at a tremendous rate until it is finished; but once it is completed, he seldom attempts to enlarge or remodel it in any way, but spends his days in luxurious ease, coming out to get his breakfast soon after sunrise, while the dew is still on the grass, at which time he makes his most substantial meal, though he

may occasionally be seen feeding at any time of the day. At noon, he is pretty sure to make his appearance above ground for luncheon, but apparently spends more time in sunning himself than in eating. Late in the afternoon he again shows up, and feeds until nearly sunset, when he descends into his burrow for the night. It is not often he is obliged to go many steps from his doorway in order to fill himself, and by autumn he has usually reached a perfectly ludicrous state of obesity. There are generally several openings to his burrow, connected with well-beaten paths; similar paths radiate off into the grass in all direc-



THE YELLOW-HAIRED PORCUPINE

Figure 9. Porcupines can be readily overtaken in their native wilds and killed without the use of gun or pistol. They are eaten with relish by the Indians, and their squaws use the quills in their fancy work. In the mountains they have been found at very high altitudes, 12,400 feet in Colorado. Copied by the author from "Mammals of America," The University Society, Incorporated.

tions, from one clump of clover to the next, and only too often to the bean-patch or the garden, where it pleases him to eat out the tender inside of several cabbage heads in a single night." Then, after giving it as their opinion that a woodchuck will consume everything that grows in the garden, or in the orchard, in the way of vegetables, fruits, and leaves, these interesting authors proceed to say that "his attitude toward his enemies is apt to be one of obstinate defiance. Other wild animals of his size prefer, almost without exception, when in the proximity of houses, to remain in hiding during the day, only venturing out under cover of darkness. But the woodchuck often digs his hole within a few rods of a farm-house,

and swaggers boldly about the garden at midday, helping himself to whatever appeals most strongly to his appetite. When pursued, he scrambles in frantic haste for his burrow, his black heels twinkling in the sunshine as he goes; but on reaching safety, he is likely to turn about and thrust out his nose to chuckle defiance at his pursuers. If cornered, he is always ready to fight anything or anybody, and a dog lacking experience in such



OUR PORCUPINES CLIMB TREES

Figure 10. If occasion demands, the porcupine in this picture shows what the animal resorts to in his usual deliberate way. Courtesy of The University Society, Incorporated. From "Mammals of America."

matters is likely to get the worst of it, for a woodchuck's incisors are weapons not to be despised. If their den is dug out, the woodchucks often manage to escape by burrowing off through the soil after the manner of moles, filling up the holes behind them as they move along, and evidently not coming to the surface until sufficient time has elapsed to ensure their safety; though how they manage to avoid suffocation in the meantime is a question difficult to answer."

What I take to be a probable explanation of this remarkable habit of the woodchuck is, that in all old burrows made by the animal there may be one or more *blind passages* leading from the central living-space in one direction or another, but which in no instance come quite to the surface at their further ends. Now when a woodchuck that has constructed its burrow in this manner finds that somebody is trying to dig him out, and is coming uncomfortably close to making a success of it,

all he has to do is to run into one of these blind alleys of his, and quickly seal up the entrance to it with earth. The diggers pass this point as they follow what they take to be the main passage of the burrow, leaving the woodchuck behind them in the branch-burrow, now closed at both ends, but containing an ample amount of air to permit him to breathe until his would-be captors give up the pursuit; then the prisoner may either back out into the main burrow, or dig to the surface at the other end. I have often noticed, where attempts have been made to dig woodchucks out—especially old fellows—that, when not taken, there is next day another burrow which did not exist before, and which was opened from within, outwards. This is the way I explain to myself how the thing happens. Farmers often use a hard, close-shooting shotgun, with coarse shot and good powder, to



Photograph by A. R. Dugmore.

A CANADA PORCUPINE

Figure 11. As the animal appears when its quills are thrown forward in a defensive attitude. Two at a birth, once a year, is the rule with these rodents; they are ugly, prickly little things.

kill woodchucks, and in this way destroy quite a number. Many others are caught in steel traps, but from these the animal often escapes by gnawing off its own leg as near the jaws of the trap as possible. Sometimes a woodchuck will pull the trap down a burrow as far as he can do so, and seal himself in; it then becomes quite a task to unearth him and pull him out, for he hangs on like an armadillo in a similar predicament.

The habits of woodchucks are formed and very much influenced by their environment in nature, by which I mean the character of the place selected by them for their homes. Where one makes his burrow in the middle of an extensive clover or other pasture, where there are no walls, trees, rocks, buildings, or, in fact, anything about the place for a considerable distance, that animal meets with a very different experience in life, as compared with other individuals of the species that live their lives under vastly different conditions. Such a woodchuck may never know what it means to climb a tree, or to lie on a big boulder and sun itself; or what garden fruits and vegetables taste like; or a number of other things that come into the lives of woodchucks living in orchards or in close proximity to kitchen-gardens.

Again, the woodchuck that makes its abode in the forest is another animal, in some respects, digging its burrow among great rocks, with the perpetual shade of trees overhead instead of the broad expanse of sky. Such an individual knows not what a pasture or a garden looks like; its life is spent among the surroundings which the woods bring to it—perhaps nearness to a little brook, or dense undergrowth, masses of rock, or trees that have fallen, or old, moss-covered tree-trunks, and so on. The life of

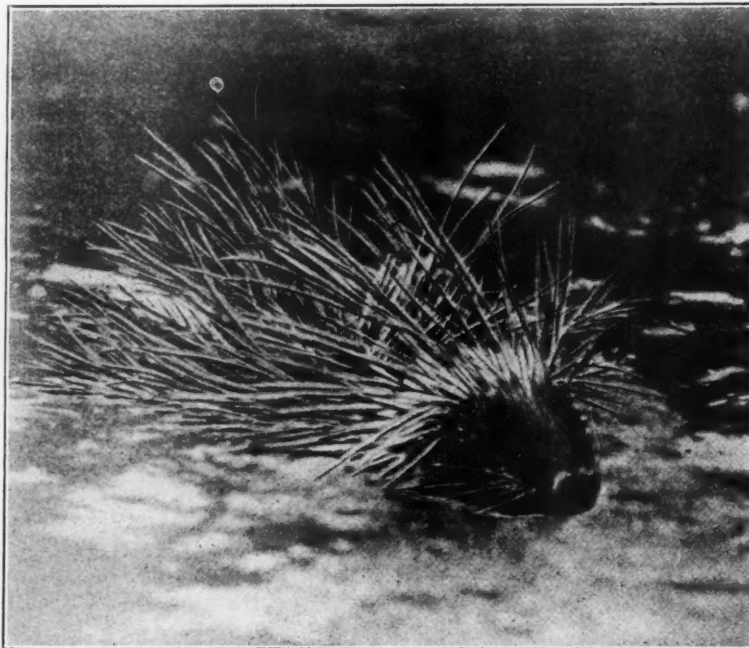
such an animal may be easily imagined. He becomes familiar with many kinds of birds and mammals living under the same conditions, and he lives upon very much the same kind of food, which may become scarce at times and reduced to a meagre supply of berries, mushrooms, buds, plants, and roots, and, when hunger presses, the bark of trees and shrubs. Very rarely does he become fat and corpulent as do his brethren of the pastures and gardens; he grows sleek and more agile when his means of livelihood are at their best, but decrepit and thin when they fail him. When in the heyday of his existence, he may "frequently be seen," say Stone and Cram, "of a summer afternoon stretched in the sun along some half prostrate log, evidently glad to take advantage of whatever of the sun's rays manage to penetrate among the

shadows of his retreat. Enjoying as he does comparative immunity from the attacks of men and dogs, and having at the present day very few enemies to avoid, he should—and in all probability often does—live out his allotted time; and it is no uncommon thing to find the bones of these animals in hollow logs and similar places, showing no signs of having suffered a violent death. A careful observer of nature once told me that he had seen a woodchuck apparently very old and feeble, laboriously digging a shallow hole in the soft earth, and that on returning, some hours later, he had discovered him curled up at the bottom of the hole quite dead, undoubtedly having died of old age after digging his own grave and crawling into it. He believed this to be a regular custom with them, and said that he had met with a number of people who asserted the same thing."

Foxes are great enemies of the woodchuck in regions where both are found, while some of the larger hawks feed upon the young when they first come out of the parental burrow and sun themselves about its entrance. The old ones are not especially solicitous of the safety of their progeny, but instances might be given where the reverse is the case. There is no especial difficulty experienced in raising one of these little fellows for as they grow, they be-

come as tame as can be, though they never seem to develop any genuine affection for their master. Many a baby woodchuck has been reared by the farmer boys of New England, and it is safe to say that many more will be reared by them in the future.

During the time I was post surgeon at Fort Wingate and writing about the animals of the region, I made the following brief notes: "Of the hoary marmot I have never seen a specimen, and I have no good account of the animal at hand. My knowledge of the Rocky Mountain marmot stands pretty much in the same case, although several years ago I shot a specimen of this species in the Medicine Bow Range of the Rocky Mountains of Wyoming; but he fell in a position where it was impossible to recover my prize. A number of them were



PORCUPINE SWIMMING

Figure 12. This is another remarkable photograph by Mr. A. R. Dugmore, and shows how the animal looks when it is in the water. Note how the quills always project when the animal is swimming.

out together, standing near their burrows; every once in a while one of the party would give vent to a rather prolonged and peculiar whistle, whereupon some of them would sit up on their haunches, and others take to their burrows with all possible speed." As to the Rocky Mountain marmot, I am not positive that I have ever seen the species alive, as it was not common in any locality where I happened to be in the West.

The habits of the two species we have in this country—the Canada porcupine and the yellow-haired one of the West—are much the same; in fact, the animals are close-

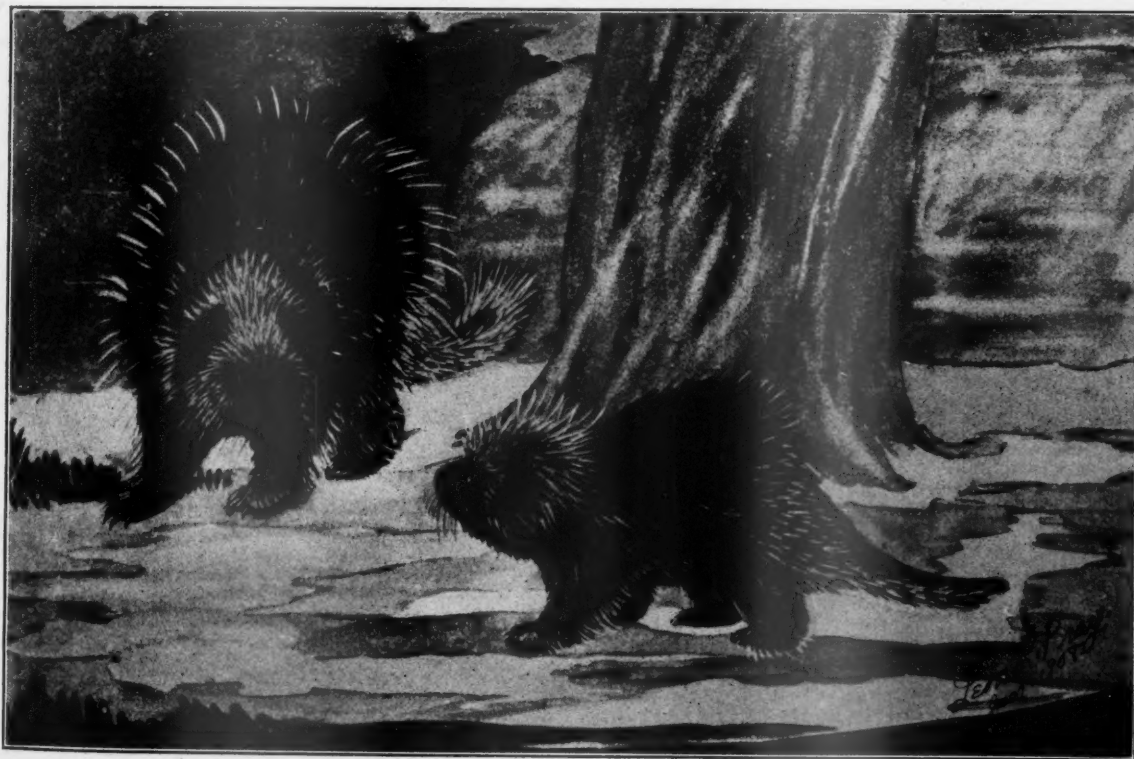


Courtesy of The University Society, Incorporated.

WESTERN OR YELLOW-HAIRED PORCUPINE

Figure 13. Among American rodents, this Porcupine is only exceeded in size by the beaver. In some parts of the country the porcupine is called the "quill-pig," but why a "pig" is not apparent.

ly related. Personally I am better acquainted with the latter form, as the porcupines were very common in Wyoming in the pine forests. I remember very well the first one I ever saw. It was a big fellow; and, seeing it at a distance in a cotton-wood tree, I took it to be a bear cub and behaved accordingly. That same afternoon, Lieutenant Rufus Brown (of the 4th United States Infantry) shot one and brought it into Fort Laramie. He had a fine setter dog at the time, and when the porcupine lay on the ground in front of his quarters, this dog ran out in high glee to meet his master. Dash-



FEMALE PORCUPINE AND HER YOUNG

Figure 14. Young porcupines are not one whit handsomer than their mothers, and they in no way attract us as pets. It is said that old ones sometimes attain a weight of forty pounds.

ing up to the porcupine, he ran his nose into its fur, evidently with the intention of ascertaining what kind of game his master had been killing; but he withdrew his muzzle very much quicker than he had inserted it, and as he did so, it was seen to be most elegantly ornamented with a fine bouquet of spines or quills, some of which were three or four inches long. A howl followed this exploit, and the lieutenant spent the best part of an hour in extracting the vicious spines from the poor dog's snout.

Cougars, when hungry, will sometimes tackle a porcupine for a meal, and always with the result of sticking



AMERICAN PORCUPINE

Figure 15. This is one of Mr. Elwin R. Sanborn's best animal pictures, and is here published by his permission through the courtesy of the New York Zoological Society.

the mucous membrane of the mouth full of quills, from the wounds of which death is almost sure to ensue. When I was with an expedition in the Big Horn Mountains, a fine mountain lion was found dead; upon examination it was soon ascertained that it had been the victim of an experience of this kind. The same thing has happened to wolves, coyotes, and semi-domesticated dogs about Indian camps in the Northwest; for this reason the Indians of that region detest the animal, and it is likely that many a one has been killed by them through sheer revenge. It has also been reported that lynxes have met with a similar fate; getting their mouth cavities stuck full of quills; they have died in consequence,

due in part, to the inflammation set up, and also to the fact that owing to the structure of a quill, it will work its way through the flesh until it, in time, punctures some one of the main arterial vessels of the neck, when death follows. Why these slender, cylindrical little quills behave in this manner after they get into the flesh is easily perceived, as each one is reversely barbed along its farthest extremity, so that, once favorably implanted in the flesh, the victim is quite unable to extract it. Through the involuntary muscles of the part it is caused to work deeper and deeper, eventually terminating as just stated.

The Fisher, however, very frequently gets away with a porcupine; this is done by attacking it at the throat, where the fur is short and soft, and the quills practically absent. But even the Fisher in his eagerness to kill sometimes makes a mistake, and in the mix-up the porcupine may get a chance to whack him in the face with his heavy, spiny tail, driving home a score or two of good, big quills. These produce the usual amount of intense pain, and may later terminate the career of the incautious musteline.

Porcupines have five toes on the hinder pair of feet, all armed with long, curved claws, while the front pair, similarly provided, has but four toes each. Their ears are small and quite concealed in the surrounding fur; the tail is moderately short, and the eyes comparatively small and lacking in animation. Late in the spring the female gives birth to her two young, breeding, as a rule, but once during the year. A hollow tree is commonly selected for her nest, though other situations are occasionally chosen. A well-known writer states that they are "hardly fit for food; and as in all vegetable feeders among wild game, are not infrequently infested with intestinal worms. Much of their time during the day is spent in sleep; but when abroad they feed upon the bark of a number of varieties of trees, often denuding, in the case of a single animal, as many as a hundred trees during a season. In this way it is very destructive; and when once it attacks a tree, it usually never leaves it, except to repair at night to its nest, until every vestige of bark has been eaten off."

In most eastern districts porcupines are now becoming quite rare; and while they are fully capable of becoming domesticated, they are not, upon the whole, very engaging pets. It is said that the animal, during the night, often gives vent to a low and peculiar cry, which, once heard, is not easily forgotten; its well-known growl when teased is quite characteristic.

When feeding, these animals will often sit up like a "prairie dog," and use their forepaws to hold their food while they gnaw it; they are fond of green corn, fruit of most kinds, and almost any of the garden vegetables. They will gnaw the prongs of the skulls of antelopes found on the plains, or the antlers of dead deer, or the horns of cattle that have died or been killed near their haunts. Indeed, porcupines will chew and eat

(Continued on page 180)

ON THE MURMAN COAST

BY JOHN D. GUTHRIE

(FORMERLY CAPTAIN, 310th ENGINEERS, U. S. A., A. E. F., NORTH RUSSIA)

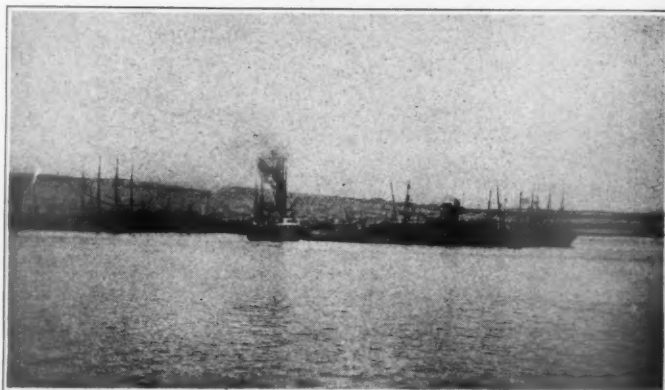
FROM the northernmost point in Europe, known as North Cape, two peninsulas stretch out. A large one, toward the southwest, is the Scandinavian; the other, much smaller, to the southeast, is called the Kola Peninsula. If you follow down the coast from North Cape, you will find an indentation, marked Kola Bay. This long stretch of coast from North Cape to the White Sea is known as the Murman (Norman) Coast. It was the writer's good fortune to spend some time on the Murman Coast, in Russian Lapland, in April, 1919.

We had left Harwich, called by all good Englishmen, "Horridge," on the east coast of England in early April on board the U. S. S. "Galveston," en route from France to Archangel, Russia. After a day or two up along the east coast of Scotland and past the Shetlands and the Orkneys, we swung northeast for North Cape and the coast of Norway, where wonderful views were had of the magnificent fjords. We then crossed the Arctic Circle and shortly after passed within plain view of North Cape, a bold, snow-clad promontory jutting out from Europe into the Arctic Ocean. A rugged shore, snow-covered, rising precipitously out of the sea for thousands of feet, with no sign of life ashore, one realized that none but a hardy race could survive in that region.

Shortly after passing Varanger Fjord we steamed into Kola Bay, and thence up the narrow Kola Inlet for some thirty miles, mostly through floating ice, dropping anchor off the town of Murmansk. We had on board some twenty-five British officers and soldiers and several hundred American Army officers and enlisted men, bound

for the American Expeditionary Force, North Russia. Even the snow-clad hills and the reindeer looked inviting after some five days of the Arctic Ocean. On account of the necessity of trans-shipping at Murmansk to a Russian boat, we waited in the harbor for some ten days, going ashore each day and seeing the town and the surrounding country. Murmansk and the outlying country

proved to be an intensely interesting locality, and a great surprise in many ways. The town, which is in latitude about 69° North (about the same latitude as southern Greenland, or 2° north of the northernmost point of Iceland), well inside the Arctic Circle, dates only from 1916. It sprang into being upon the construction of the railroad from Zvanka (on the Petrograd-Siberian Railway) to Kola Bay, a gigantic undertaking of 660 miles, put through by the Russian Government while the war was in progress. Murmansk is Russia's only ice-free port on the north; the strategical importance of such a railroad during a world war can readily be appreciated. The construction of this railroad, through frozen marsh and tundra, and through a country of innumerable lakes, would make a fascinat-



BOATS AT THE DOCKS AT MURMANSK

The hills in the background have a scattered growth of Scotch pine and birch.



INSIDE THE ARCTIC CIRCLE

Snow and ice on the decks of the ship on its way to Murmansk.

ing story, built as it was during the long Arctic winter, and largely by German prison labor. Kola Inlet runs in south from the Arctic Ocean for some forty-six miles being rather narrow and protected on both sides by high hills covered on the slopes with a scattering stand of Scotch pine, birch and willow. The harbor of Murmansk is almost ideal for a large port, and the prediction is made that some day Murmansk will be one of the important ports of northern Europe. While the

town of Murmansk is new, the little towns nearby are old. Kola, which is some six miles south of Murmansk, is mentioned in Russian history as far back as 1264, and it is not known at what time this region came under the rule of the Slavs of Novgorod. Kandalaksha and other small settlements along Kola Inlet were founded during the fifteenth century. The natives adopted Christianity



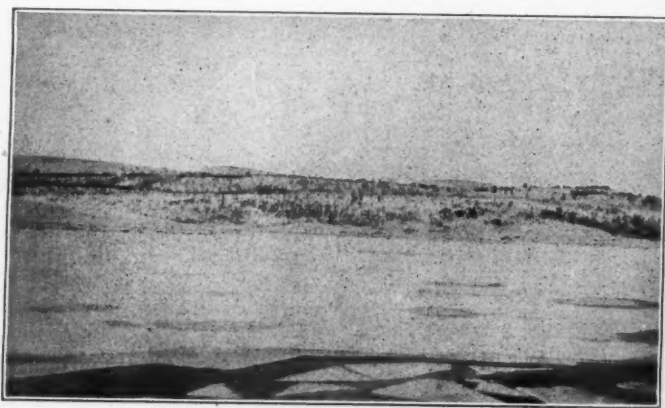
RUSSIAN LOG HOUSE AT MURMANSK

The author and another American officer having their photographs taken. In the background a flag is flying in front of the Italian Consulate.

about 1533 and a monastery was started at Pachenga. Russian merchants from Novgorod were the first to come in and soon trade became important. The general character of the country is what one might expect from such a latitude, but the presence of pine and spruce trees, even if rather scrubby, was most unexpected. On west slopes of the hills and ridges about Murmansk and Kola there were fair stands of Scotch pine and some spruce, and birch and willow were abundant. On the western part of the Kola Peninsula, owing to effects of the Gulf Stream, pine and spruce are found within twenty to twenty-five miles of the Arctic Ocean, while in the eastern part of the Peninsula, timber is not found until you are from sixty to seventy miles from the coast. Throughout all this country, however, birch and willow are most abundant along stream and lake shores while the berries found in extreme northern latitudes are present. Kola Peninsula is on the whole a vast wilderness almost entirely devoid of roads and settlements. It is rather broken, and yet swamps and peat bogs are everywhere, even on side hills and on the tops of ridges. The soil is for the most part stony near the coast while inland it is composed more of turf or decayed tundra. Glacial boulders are abundant. Everywhere are lakes and swamps, linked together, with the drainage northerly into the Arctic Ocean. Near the central part of Kola Peninsula the country rises into a sort of highland, reaching an elevation of some 4,000 feet, and these highlands are known as the Chibinsky Mountains, and here the Lapps take their reindeer during the summer months for pasture. Bare rock and sparse

vegetation are characteristic, except on west slopes where there is some tree growth. Further south, along the Murman Railroad there are better stands of pine and about forty miles south of Murmansk the timber is fairly heavy, while ninety miles south, at Imandra, is located a sawmill, others being located still further south along the railroad. The fauna of the Peninsula is similar to that of far northern latitudes. Fox, otter, marten, bear, deer and hare are said to abound, and while the writer saw none of these animals alive the skins of most of these were seen frequently in Murmansk, at the market or being worn by the natives. Bird life includes partridges, willow grouse, capercailzie, black cock, geese, loons, eiders, and such smaller birds as larks and snow bunting. At the Chinese market in Murmansk beautiful black cock and capercailzie were seen (frozen solid, and unplucked) on sale, as well as hare. Along the coast numerous aquatic birds visit in hundreds of thousands for breeding.

Reindeer were abundant as the only beast of burden, carrying passengers and supplies between the little settlements, being driven tandem and with no reins at all so far as seen. There are said to have been only two horses in the town of Kola before the railroad came in 1916. Fish of many kinds are found in the many lakes and along the inlets and the coast. Salmon seemed to be the most often on sale although there were herring and cod. Fish constitutes a large part of the food supply of the people. In the Murman region alone some 4,500 men are engaged in



BLEAK AND BARE AND COLD

The ice-covered Kola River, with scattered forest growth on shore. Ice was constantly floating down during our stay.

the fishing industry. As is to be expected, agriculture plays a very small part in the industrial life of most of the Kola Peninsula. A small quantity of potatoes is grown by the Lapps just south of Murmansk, and some hay is raised, the total crop for this entire region in 1914 is said to have been only 2,700 tons. Further south, along the west coast of the White Sea crops of rye, barley, potatoes and oats are grown. Fish and lumber are the principal products of the Kola Peninsula as a

whole. There are sawmills at Imandra, Kem, Soroka, and several other points along the railroad south from Murmansk. Sawed lumber was fairly abundant at Murmansk though most of the buildings there were constructed of logs, even two or three stories in height. The Russian workman is an artisan when it comes to working with wood, and about all he has to work with is an ax (that looks as if it might have come down from Peter the Great!) and a saw. One hardly expects to find the Gulf Stream in Northern Russia, but its influence is most marked and makes that country habitable, and is responsible for Murmansk being Russia's only ice-free northern port. The winds from the north and north-west are the mild ones; the south and southeast winds coming from the land are cold. The climate is in general therefore milder than at Petrograd, which is some 1,000 miles further south. Winter lasts from the middle of November until the middle of April. The snowfall is naturally heavy, 15 to 20 feet, and houses in Alexandrovsk near Murmansk, are said to be often entirely covered over night; there was some three feet of well-packed snow on the ground at Murmansk when we were there in April. The long winter is followed by a rainy season, hardly to be called spring, for with the coming of the rains the whole country seems to shed its snow and ice at once, and summer comes with high temperatures and twenty-four hours of sunlight, and innumerable mosquitoes. The rainfall is less than one might expect. In Northern Norway it reaches 69 inches, while going southeast along the Kola

borealis, however, this long night is not as dismal as it might seem. While at Murmansk we witnessed almost every night the most brilliant displays of the aurora, bright enough at times to read by, or almost bright enough to take photographs. There is a government meteorological station some 25 miles north of Murmansk where records have been kept for many years. The



WHEN HEAT WAS NEEDED

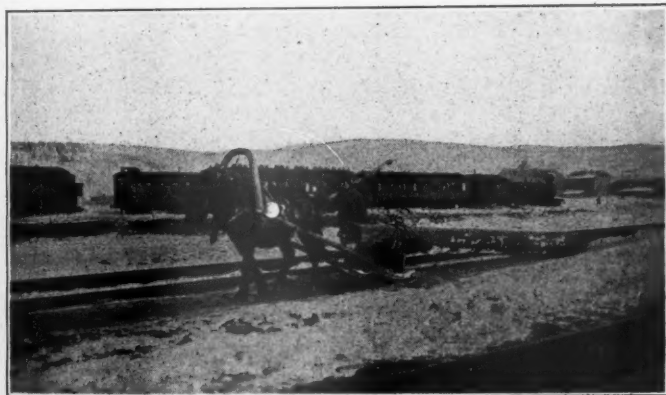
Russian peasant women getting fuel wood from a pile of mill-ends brought to Murmansk by train from the sawmills at Kem.

mean temperatures are given as 14° F. in winter and 55° F. for summer, by the government records. On the White Sea coast however the temperatures go down as low as -35° F. The Polar ice has never been known to reach the Murman Coast. Off the coast the sea never freezes and steam vessels can traverse the bays and gulfs at all seasons. In the inlets, back from the coast, ice forms, and if the inlets are fairly narrow they are apt to freeze to a depth of 8 to 10 inches. Ice was floating down the Kola River all the time that we were there. The severest climate of the entire Murman Coast is said to be in the immediate region of Varanger Fjord, on the extreme western point of the Murman Coast.

The shortness of the summer season, the lack of drainage and the great depth to which the soil freezes, are the determining causes of the relatively scant vegetative cover of most of the Kola Peninsula. As mentioned previously, however, due to the influence of the Gulf Stream, these factors are mitigated to such an extent that the climate and the consequent flora constitute a distinct surprise, as compared to areas hundreds of miles further south but unrelieved by the influences of a warm ocean current. The

flora of the Arctic Region of Kola Peninsula is said to be much more akin to that of northern Siberia and North America than it is to that of Central Europe.

Kola Peninsula covers some 57,000 square miles, or is about the size of the State of Michigan. Before the building of the Murman Railroad the population was given as 14,300, consisting of Russians, Lapps, Finns and Norwegians. The present population (1919) was



A RUSSIAN TEAMSTER

Hauling a Scotch pine log at Murmansk. The Russian ponies are small, look weak, but are wonderfully tough. Combination Russian passenger and freight train in background.

Peninsula it decreases rapidly to a mean maximum of 14 inches, mean minimum of 1.7, with a mean average of 7.17 inches—based on government records covering a period of eleven years. This figure does not include the snowfall; as this is very heavy, the total precipitation is therefore much greater than the above figures would indicate. The Polar night lasts from November 26 until January 22. With the frequent displays of the aurora



AFTER A FOOTBALL GAME

Football at Murmansk in four feet of snow in April seems rather out of place, but the American and two British officers are returning from such a game played by British soldiers.

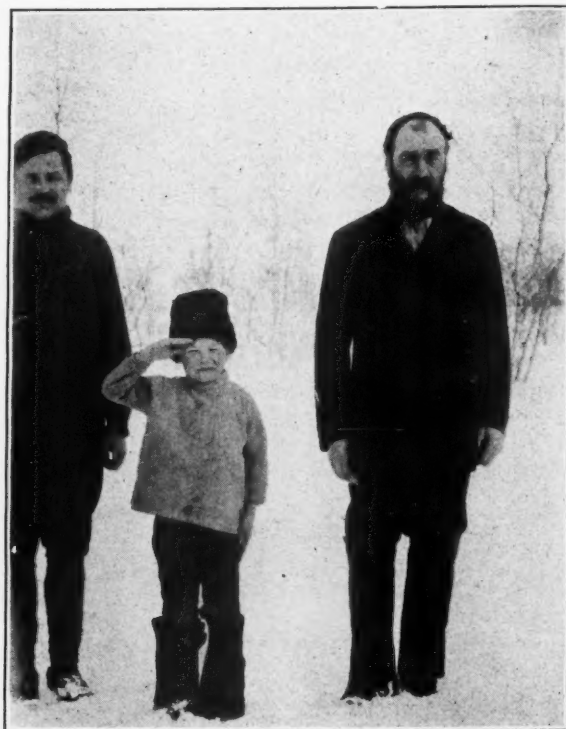
estimated to be about 25,000, mostly Russians brought in by the railroad. This population is mainly along the coast. In the interior about the only inhabitants are the Lapps, a pastoral people, who live for the most part on their reindeer and on fish. They live mostly in sod-covered huts, near the lakes while fishing, and in the bark and brush "wickie-ups" (much resembling those of the Apache Indians of Arizona) while in the highlands herding their reindeer. The Finns have somewhat different modes of livelihood, being principally engaged in hunting, some farming, lumbering and packing.



A SEAL ON WHITE SEA ICE

Looking directly down on a seal from the deck of the "Galveston," in the White Sea.

Murmansk, when the writer was there, was a very cosmopolitan place. There were English, Canadian, Scottish, French, Polish, Serbian, Italian, Russian, and American officers and men, and a civilian population of Lapps, Finns, Russians and Chinese. He recalls a boxing match one night there, between American sailors and British sailors, in a Y hut. Verily, it seemed as if the ends of the earth were met. Each announcement during the match had to be made in three languages, Russian, English and French—and then it is doubtful if half of the audience understood. The matches were refereed by a British Admiral whose decisions were short, sharp, just, and admitted of no argument. Following the British



RUSSIAN PEASANTS NEAR MURMANSK

The "Sacha" is trying to give the American salute. The forest growth is indicated by the scrubby birch in the background.

custom, and much to the disgust of the Americans present, no cheering nor "heckling" whatever was allowed except *between* rounds.

Murmansk, being a new town, was laid out in a most sensible manner, and evidently with the expectation that it would be a large and important port. The city was planned to have a port district, naval base, market, labor, service, and administration districts, but the revolution of course put an end to further development. The town in April, 1919, consisted of some 300 buildings, all of logs, and mostly one-story in height. There were extensive railroad sidings and yards, shops, large warehouses and barracks, a fire department, church, a Y. M. C. A., wireless station, and several foreign consulates. Most of the buildings were used as barracks or

storehouses as large quantities of war supplies were still stored here. Some of the foreign troops and many of the native Russians were living in railroad cars.

At Murmansk, Kola Inlet is one and one-half miles wide, 32 feet deep near the docks and 70 feet deep in the middle, with a tide of eleven feet. On both sides of the Inlet the hills rise 300 to 400 feet above the water and are so located that not only do they protect the harbor from storms but also from submarines. Due to the curved shores and the currents a submarine is compelled to come to the surface several times in approaching the

harbor and thus could be readily fired on from guns located on either side of the narrow channel. After spending some time at Murmansk we trans-shipped to a Russian ship, the "Kanada," and set out for Archangel.

The "Kanada" was an ice-breaker, of fine construction, and was originally built for use on the St. Lawrence River, for Earl Grey while he was Governor-General of Canada. Later it was sold to the Russian Government and rechristened the "Kanada." Thus ended for the winter a brief but intensely interesting stay on the Murman Coast, well inside the Arctic Circle.



A GROUP OF OFFICERS

British and American Army and Navy officers on board the U. S. S. Galveston.

STARTING TREES FROM SEED

PERHAPS the cheapest and frequently the best way to start a forest plantation is to collect seed from hardwood trees and grow seedlings. The collected seed will be fresh and the seedlings grown from it should be thoroughly acclimated so far as climate is concerned, say the forest specialists of the Department of Agriculture.

Seed should not be collected before they are ripe, and this means for most kinds of seed that the work should be done during autumn, usually after frost. Collecting may be extended into the winter for such species as ash, catalpa, honey locust, sycamore, and others which retain the seed on the trees until that time. A few varieties of seed, such as elm, silver maple, red maple, willow and poplar ripen during the spring or summer and should be gathered promptly before they are scattered.

Middle-aged trees growing in the open, where they have been permitted to develop broad, spreading crowns, ordinarily produce seed in greater abundance than trees growing in a dense forest. The fruit of some hardwood trees requires special treatment to separate the seed from the fleshy covering, pod or hull before they are planted.

The best time to sow seed, either in the nursery or in the permanent planting site, is soon after it is ripe, but when this is not possible the seed must be stored until

spring. If this is done, the seed must not be allowed to dry out excessively, because this impairs its power to germinate. Seed should be stored in a cold place.

When the seed are to be planted, a good, well-drained, preferably loamy soil should be selected. Proximity to the farm dwelling is desirable, because rodents are less likely to be abundant. Preparation of the seed bed should be similar to that of getting the soil ready for a vegetable crop. Except on commercial plantings where the seed are sometimes sown broadcast, it is best to plant with a drill in rows sufficiently far apart to permit horse cultivation. With small, or thin seeds, such as that of birch, elm, or sycamore, best results will be obtained by sowing broadcast rather thickly over the beds, pressing the seed into the loose soil with a board and covering it very lightly with soil and a light mulch of leaves or straw. When the seedlings are 10 or more inches in height, they are large enough to be transplanted to the field. Most of them reach this size in one growing season. In digging them, care should be taken to injure the roots as little as possible. Injured portions of the roots should be cut off with a sharp knife. The seedlings should not be dug until the time for planting them in their permanent location, for exposure of the roots to the air for any length of time will kill them.

A VISITOR back from a short trip to Southern California says that the mountains in that region show the activities of the Forest Service everywhere you go. Along all the trails are innumerable familiar looking signs and fire lines, sign boards, etc., which show the activity of the Rangers in that region even though they themselves kept well hidden in some distant Ranger Station.

THE monthly meeting of foresters located in and near New York, at the Yale Club for luncheon, to which all visiting foresters are cordially invited, as announced on page 38 of the January issue of *AMERICAN FORESTRY*, will be held in future on the *first Tuesday* of each month instead of the first Thursday. The last meeting was attended by Messrs. Sterling, Baker, Murchie, Cronk, Moore, Rothery, Porter and Nelson Brown.

FOREST GUIDES DEPARTMENT

SOLAN L. PARKES, EDITOR

Boy Scouts who are enrolled as Forest Guides may write to this department and ask questions about trees, woodlands, forests, or anything relating to them, and they will be quickly answered. Every Forest Guide troop in the United States should have this magazine.

FOREST GUIDES should be able to identify every shade tree or forest tree that they see and also to tell its characteristics and uses. It is not difficult to acquire such knowledge, but at the same time when the suggestion is made, the Guide will very likely ask himself the question, why should I make an effort to become acquainted with trees? Are they not commonplace things? Does not everybody know what they are?

These questions are very well answered by Joseph S. Illick, one of the leading experts on tree identification in the United States. He says: "At first the Forest Guide cannot satisfy himself that the study of trees is important, but as he revolves the question in his mind he begins to see what a wide and practical application to everyday life this subject has, and that trees ever since the creation have been among man's best friends and most useful helpers, and as time goes on and wood becomes scarcer they will play an even more important role in satisfying his needs.

"Suppose we pause just long enough to think about a few of the ways in which trees have been our friends and helpers. We cannot begin to take an itemized census of all the different benefits derived from them for we would soon have a list as long as our arms and only half finished, but in order that we may not overlook entirely some of their good points a list of the most important of them follows:

1. Trees decorate the landscape. A treeless place is indeed cheerless.
2. Trees supply us with shade and shelter, and protect our houses and other buildings against storms.
3. Trees beautify our homes, highways, and byways.
4. Trees give shelter to and serve as a refuge for birds and other wild animals.
5. Trees supply shade and shelter to domestic animals when in the open.

6. Trees help make, fix, and improve the soil.
7. Trees protect steep mountain slopes against erosion, and bind the soil along the banks of streams.
8. Trees increase the run-off of water during periods of drought.
9. Trees help purify the atmosphere.
10. Trees decrease the run-off of water during periods of flood.
11. Trees help maintain and improve the health and efficiency of our citizens.
12. Trees help raise the moral standard and social worth of our boys and girls.
13. Trees furnish the raw material for many of our most important industries.
14. Trees supply us with some of our most necessary products of life. They supply us with the wood with which to build, furnish and warm our homes. They are the main source of the raw material from which the paper upon which we write is made.
15. Every Forest Guide should become acquainted with our trees so that he can recognize the difference between the important timber trees and the inferior (weed) species.

HOW TO BECOME ACQUAINTED WITH TREES

"There is more than one way for Forest Guides to become acquainted with our common trees. Some Guides are so fortunate as to have a teacher available who knows the trees and is willing to point out their distinctive features and peculiar habits. Other Guides are less fortunate in that they do not have a teacher familiar with the trees, but they do have available for use a good supply of helpful tree leaflets and manuals. But there is a third group of Guides, and this includes by far the largest number, who have neither a good teacher nor satisfactory literature available to pursue a course of tree study. It is primarily for this third class of Forest Guides that the material on the following pages has been prepared.

"One of the first things which a Forest Guide should know about tree study is the fact that to attempt to learn to know all the trees is a big and long job. It may be well in this connection to remember the old adage, 'Do not attempt too much for fear of accomplishing too little.' Much better results will be attained by selecting a

small group of trees, or a certain number of representative species and learn to know them well, rather than attempt to master all of them and later on find that you have acquired only a superficial smattering of most of them and know none real intimately.

PLANTING TREES

"Every Forest Guide should be a tree planter. It is a helpful and wholesome kind of work. In order that each Guide may know some of the good points of tree planting, a list of the benefits which may be derived therefrom follows:

1. Planted trees will help supply the constantly growing demand for wood. They are a credit to us who set them out, and will be a blessing to future generations. Cheap wood is gone forever in Pennsylvania.
2. Planted trees afford excellent protection to our water supplies and prevent erosion on steep slopes.
3. Planted trees beautify and protect homes and make our landscape cheerful.
4. Planted trees utilize the energies of nature which might otherwise be wasted.
5. Planted trees beautify and improve highways, waterways, and byways.
6. Tree planting will make worthless land productive and yield useful forest crops.
7. Tree planting will help fill up the storehouse of needed wealth.
8. The planted forests of France helped win the war.

"There is great need for forest tree planting. It is not hard to find places upon which trees should be planted. Bare hillsides and poorly stocked mountain land is common, idle corners are present everywhere, and eroding slopes and gullies are doing enormous damage in every community.

OTHER THINGS TO DO

"Stopping of forest fires will do much to rebuild our devastated forests, but there are other things which must also be done in order to place them in a satisfactory condition. These important tasks should go hand in hand with or follow right after protection. Some of these essential things are:

1. Securing a new growth of valuable trees as quickly as possible on every acre of devastated land within the State. We cannot afford to leave so many acres of mountain land remain idle. It does not pay to delay. Right now is the time to see to it that all unproductive areas of forest land are so stocked with trees that they will begin to produce a valuable forest crop.
2. Another thing to do is to give preference to the important forest trees and eliminate as rapidly as possible the undesirable kinds. Nature does not show any preference for the important timber trees in the early stage of reforestation. As a rule, many

different kind of trees come up after fires and lumbering operations, and in the struggle for an existence the inferior ones often win out. If the job of restocking our forest land is left to nature entirely a great deal of ground will be occupied by worthless trees. It is our business, therefore, to learn to know the best trees, and then help them overcome inferior ones such as scrub oak, fire cherry, trembling aspen, sumachs and other similar weed trees. While in camp the Forest Guides should show their appreciation to the land owner by helping him improve the composition of his forest by cutting out the inferior trees and thus help those of better quality.

3. A third thing which is essential to rebuilding our forests properly is the removal from the forests of all trees of poor quality and undesirable form, as well as all dead, dying and damaged specimens. In almost every forest there are wolf trees, that is, trees which are unattractive, have a wide-spreading crown, and a twisted and hollow trunk. Such trees grow very little in size and are continuously decreasing in value. They should be removed from the forests for they possess no future promise, and are suppressing and even killing many young and thrifty trees beneath them. Their days of usefulness and service are past, and the way should be opened up for a younger generation of trees by removing their suppressors.

Forest Guides should make it a rule to use for camping and other essential purposes only such material as will help improve the forests, and thus assist in rebuilding them and making them even more productive and more valuable than the original forests.

4. Another important thing to do is to stock completely all forest land so that it will begin producing forest products of value. Our forests are now full of gaps and openings in which nothing of value is now being produced. Many of these areas are small in size, while some of them cover large areas. The loss from a single blank area may not be great, but when all of them are added together, the loss is enormous.

"Let us give nature a chance to establish forests of baby trees on all these areas, but if she does not succeed, the thing to do is to go out upon these barren areas and plant upon them selected trees, which are well-known, sure to grow, and will produce a valuable crop of timber. We must not compete with nature or try to outdo her in places where she is doing good work, but our aim should be to fill in all fall places. The Forest Guides can be of great service in this work for there is a big tree planting job before all of us. It will be a creditable piece of work for the young and brave men of every State to go out among the hills and start to reclothe them with the best kind of trees which are now available."

THE FINDING OF THE HAWKS' EYRIE

BY AINSLEE B. ALLEN

IT is not very often that one is favored with an opportunity to look upon the home affairs of a Red Shouldered Hawk, for they usually build too high for a human being to climb safely. However, this opportunity came to me and I took advantage of it by securing a few photographs. Red Shouldered Hawks are not very plentiful in my section of the country and so I consider myself lucky. It was while taking my usual Sunday after-



THE REWARD OF THE CLIMBER TO THE HAWKS' EYRIE

The nest and eggs of the Red Shouldered Hawk which were found in the tree sixty feet above the ground.

noon walk that I discovered the nest. It was towards the end of April and the leaves had not yet come out. My companion is as enthusiastic about birds as I am and we had noticed on previous walks that the hawks had mated but never dreamed of discovering their eyrie. On this particular Sunday I was alone, and by chance I happened to see the female leave the nest while I was still some two hundred feet away. If she had not flown, probably the nest would not have been found. It had been built by crows the year before and had she not exposed herself, I would have thought the nest old and deserted. I was much pleased with the discovery, and, after telling my friend, brought him to the spot. Together we

made plans to ascend, for the nest was sixty feet from the ground and there was not a single limb between the nest and ground. It was impossible to tell how many eggs there were or how old they were. We longed for a pair of telegraph lineman's spurs, and a friend promised to lend us a pair. After waiting for more than a week and not receiving the spurs, we grew impatient for we feared that the eggs would be hatched before we could photograph them.

Not to be discouraged and upon my friend's suggestion, we made a crude pair of spurs ourselves. He had a pair of stilts which we cut off short, once just below the foot rest and again two feet higher. In school, a pair of steel spurs were forged and these were fastened to the stilts by strong screws. The stilts



BABY HAWKS—NOT CHICKS

Covered with soft fluffy down like chicks, these young Red Shouldered Hawks, at four days old, are making a tour of investigation of the nest.

were fastened to the inside of our legs by straps in such a position as to bring the spurs on the inside and the foot blocks on the outside.

After school, one clear day, not long after we finished our climbers, we set out with our cameras and portrait attachments. The portrait attachment gave us the power

to take a picture at a distance of three feet. While we were still a good distance from the nesting tree, the female left the nest and soared off without the least sign

of a care. My friend was very eager to climb

in the nest. I also climbed but neither of us took any pictures.

Four days later, another ascension was made and two downy white baby hawks, about the size of baby chickens, greeted us. Between them was an unhatched egg but this was not disturbed as we thought it might hatch in a day or so. These little fellows had the honor of having their picture taken when they were only four days old. They had never seen anything like us before and seemed much amused. We were welcomed to their home of sticks mixed with feathers and lice. They showed us that they had nothing to offer us to eat but they said that their father and mother were off getting something to eat and would like us to wait until they came. But we did not stay long, and, as we left, they came to the edge and, sticking out their little fuzzy heads, watched us climb down.

Our nest visit was about two weeks later when we found them no longer little white fuzzy birds with an interest in human beings. They were now about twice the size of baby chicks, dirty and the possessors of a few quills. One was distinctly larger and stronger than the other and both showed great fear of us. Now and then they uttered a cry as they closely watched every move we made. A hand extend-

ed toward them only drove them to the outermost stick of the nest and if our hands came too close, they would



GROWING LARGER AND MORE INDEPENDENT

Here they are seventeen days later, very much interested in everything that is going on.

first and I did not make many objections as I did not trust the spurs wholly, and I also feared an attack from the parent birds. We both had Brownie box cameras and these proved to be a hindrance in climbing. We either had to carry them on our belt or take hold of the handle with our teeth. My companion climbed slowly and I agreed to warn him if I saw the parent birds returning. He held tight with both arms the trunk of the tree. Now and then he would stop for a rest and make such remarks as, "Gee, this is great! I wonder if these spurs are going to hold? They pinch my feet something fierce. Where's the old birds? Don't forget to tell me if you see them coming this way."

At last he reached the nest and informed me that there were three eggs in the nest as large as hen's eggs. He took a couple of pictures and then started down. The downward journey proved as difficult as the upward.

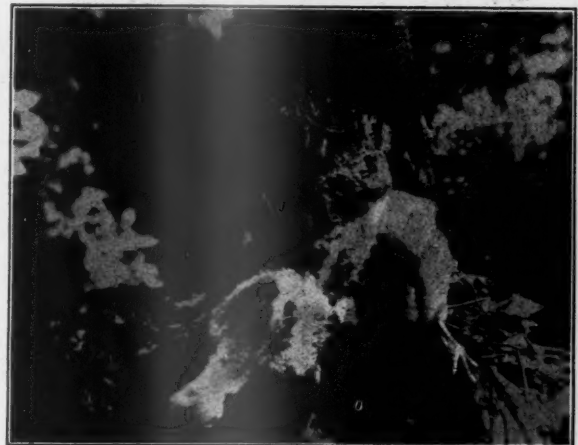
It was now my turn and before many minutes, I was on my way. It seemed ages before I reached the top and when I looked down I realized that a fall would be disastrous. I therefore held on with one hand while I took the pictures and then hastened down, partly because I thought it safer on the ground and partly because the hawk had been kept off her nest for half an hour.

Our next journey to the nest was a week later. My friend climbed and announced that the eggs were not yet hatched but that the shells each had a small hole pecked in them. This was a great surprise because the peepings of the young ones could be heard at the base of the tree and we fully expected to find young ones



A HIGH AND DIFFICULT CLIMB

It proved well worth the effort, however, when we finally reached the nest of the Red Shouldered Hawk sixty feet above the ground.



THE BABY HAWKS AT TWENTY DAYS OLD

Still of an investigative turn of mind and growing more inquisitive each day as they grow stronger.

peck furiously at them. The lone egg was still unhatched so we removed it from the nest and, upon blowing it, found it not fertile. On this day, the remains of a



FACING THE BIG WORLD

The weaker of the two hawks, at thirty days old, and just as he is ready to leave the nest and brave the dangers ahead. The stronger one has already left the nest.

mouse and a three-inch yellow feather, probably belonging to a flicker or meadow lark, were found in the nest.

At the end of another two weeks, we visited again. We found but one bird in the nest, full grown but unable to fly. It has been a mystery to me what ever became of the other bird. Either this was the weaker of the



ALL READY TO TAKE A FLIER

Filled with fear, he is at the edge of the nest with wings spread to keep his balance. This shows how well the wings are developed before an attempt at flying is made.

two with the other one already flown or else this was the stronger of the two while the weaker may have been killed by its parents or brother. We believe in the former

theory however, for we found no dead bird near by nor any trace of one.

A few days later found the nest deserted, but with little trouble the last of the birds to leave the nest was located quietly perched in a nearby tree. That was the last we saw of the hawks.

While we enjoyed watching this family of hawks in their daily life, we did not take their pictures without risk. We were attacked but once by the old birds and this was not alarming as only a single strike was made. The tree was an oak and it was difficult to sink the spurs. Many a time the spur slipped from the bark and the only thing that saved us was our two arms which clasped the trunk. There was also the constant danger of falling while taking pictures or being attacked by the old birds, for we could not hold on while using our cameras. The tree did not sway back and forth in the breeze but swayed in a semicircle.

I hope that if the readers of this article find a Red Shouldered Hawk's nest they will not molest it or shoot the birds with anything but a camera. Even this should not be done if it is going to cause desertion. Though they may steal a fowl occasionally, it has been proven that hawks feed upon mice and other harmful rodents. Too many people are eager to use their gun and it is alarming to notice the steady decrease of our valuable birds. If this keeps up many more years, every food crop will have many enemies, all of which should be the food of plentiful birds. Birds are one of man's best friends, if he but knew it, so think before you use your gun, and do not harm any bird without just cause.

GIRL SCOUTS PUT OUT FIRE

EXPRESSING her appreciation of the Forest Guides Department in AMERICAN FORESTRY, Miss Vera Laurence, an active and enthusiastic member of the Girl Scout organization, writes as follows:

"I particularly appreciate the Forest Guides. This is a wonderful plan and I feel assured my girls will be anxious to become members of the American Forestry Association and help support your good cause.

"I should like to mention the fact that on Friday last seven of my girls and myself had occasion to put our knowledge of fire-fighting into practice. Not so far from my home we discovered a fire which was burning in a patch of underbrush, weeds and tall grass. It had already burned over quite an acre, so arming ourselves with pine branches (cut from lower limbs of trees) we got to work, after first dipping our branches in a small stream nearby. We checked the progress of the fire, putting out a horizontal length of no less than two hundred feet of fire. A part beyond our reach which had traveled fast and high through a densely covered ravine, was later put out by some people in the vicinity. The girls worked very hard and really did good work."

THE annual growth is 0.65 cord per acre. 115 by 0.65 equals 75 cords (mostly poplar). The farmer usually cuts an annual crop of 75 cords. His profit is \$4.86 per cord. 75 by \$4.86 equals \$364.50.

MAN'S SECOND FALL

BY JOHN PRATT WHITMAN

"Oh, what a fall there was, my countrymen;
Then you and I, and all the world fell down."

—Julius Caesar.

ONE large full grown tragedy facing America is the destruction of her forests. A leading publisher and consumer of white paper has stated that fifty years will see the end of these proud emblems of American freedom.

"I love thy woods and templed hills." How much do we love them? That is the question. From a study of the public's affection in this direction it would appear that the dollars which the lumber brings are dearer than any sentimental emotion aroused. Here we are singing our delight in the trees, while lumbermen and pulp manufacturers are sawing off the limb on which we are depending. Presently the bough will break and down comes the cradle of liberty and all.

"Of all the dear old pictures that hang on memory's wall the one of the grand old forest seemeth the best of all," wrote Phoebe Cary. The time is not far distant when we shall be compelled to go to memory's wall as the only place where any view of the grand old forest can be seen.

A terrible dilemma confronts newspaper and magazine publishers as well as poets, advertisers, and creators of the funny supplement. We are all wildly trying to build up circulation and to be read. We give prizes, make rates, push sales in every possible way. In consequence the United States uses half of the world's white paper, and makes enough paper pulp to create a pile four feet wide and eight feet high forty-five hundred miles long yearly, a mushy path from Boston to Honolulu, and then some. No less than thirty billion feet of lumber go into paper while seventy billion feet are used up for other purposes, and the newsboy shouts with all the energy of his practiced lungs, "ex-tree! ex-tree!"

To people who live in cities, and most Americans do, this forest question is remote, and is often looked upon

as sentimental. They can grumble about high rents and the difficulty of procuring lumber, without connecting such shortage with actual growing trees. The difficulty of impressing urbanites, therefore, with the seriousness of a timber shortage is large for those who feel personally and keenly the approaching forest disaster.

If it were possible for public libraries and theatres to post signs stating that it is now impossible for Shakespeare's "As You Like It," with its scenes in the forest of Arden, to be produced or printed because of the lack

of white paper depending upon trees for its manufacture, or that "A Midsummer Night's Dream" could be seen or read no more owing to the destruction of the American paper producing spruce and pine trees, the ease-loving pleasure-seeking citizen in the large metropolis would perhaps take notice. "We are sorry," might announce one large publisher, "but all stories dealing with Robin Hood and the merry greenwood tree have been taken from our list of publications because the merry greenwood tree has been reduced to a stump, and the sylvan dells to parched fields and unmossed rocks." Indeed such an announcement would be a piece of inspirational dynamite sufficient

to jolt the easy optimists out of their chairs with horrified faces turning toward the forestry situation.

There are those who say there is to be a second fall of man. The first great descent came, we are informed, when human beings, then represented by Adam and Eve, were driven out of the forest, bag and baggage. We have ever since been struggling to win back some portion of the bliss enjoyed by those first parents in their honeymoon days spent in the Garden of Eden. Now the time has come, say experienced theologians, when forests are to be driven out from the abodes of men. It is prophesied that woes upon woes will follow, and the human being's burden doubled with the loss of the Garden. "And it came to pass, that in those days the Lord warned His people lest they destroy the great



forests of spruce, pine, maple, walnut, and other godgiven natural resources in the form of timber land, but they heeded not and went forth with ax and saw and laid low the sapling and mighty cedar until mountains became sandhills and the valleys desert lands without springs of water." Thus will run the new version of the fall of man to be read by future generations with moanings of grief and despondency. And it might be added that when those who dwelled upon the earth went forth to eat of the tree of knowledge, lo, the lumbermen had been before them, and the tree with its branches had been cut and sawed into commercial lumber at so much a foot, or made into blank sheets of paper to wait generations for worthy inscriptions by people devoid of wisdom and original thoughts.

Any day notice may appear in the headlines of some good old conservative newspaper—you and I might mention—circulating among New England descendants, with the following horrible announcement:

"Due to the shortage of lumber, shares are now on sale in the latest incorporated timber company preparing to cut and saw into usable and practicable lengths the large forest of family trees rooted in the old hulk of the Mayflower. A large part of the newly acquired lumber has already been contracted for by furniture firms for the purpose of repairing several shiploads of cradles, chairs, beds, etc., which 'came over' in the Mayflower."

Picture the consternation and panic that would be caused by such an announcement, and imagine the number of societies which would immediately spring up for the conser-

vation and preservation of American forests. The forest with its mystery and its beauty, its cool shade, its murmuring of innumerable leaves has always been the abode of idealism; and when men think of getting back to innocence, and elemental purity, it is to the forest they go. The tired business man as the heat of summer approaches finds himself breaking loose and fishing the cold streams, or clambering to the top of some noble wood-covered mountain there to breathe new life and to prepare for another winter of monotonous grind.

What would childhood be like without the forest? Think back to your own boyhood or girlhood and try to picture your youthful years without Little Red Riding Hood, the Three Bears, Hansel and Gretel, Hop 'o My Thumb, Peter Pan, and a host of others including the Babes in the Woods, Sleeping Beauty, etc. Let us strike all trees and woods from literature until the public has a proper realization of what the tall timber means to civilization.

If it is more effective to appeal to the practical than to the sentimental, we have not far to go. Walk down Fifth Avenue, New York City, on a frosty morning and take note of what you see. There will meet your eye a veritable circus procession of the creatures of the wood. The otter, rabbit, fox, wolf,

bear, coon, squirrel, mink, sable, beaver, leopard, and a host of smaller creatures, all unconscious so far as their wearers are concerned, that not one would be there were it not for the forest home where they live in den and dingle.

Fur-bearing animals will surely disappear with the wholesale destruction



UNKNOWNLY, THE NEWSBOY CRIES
THE STORY OF THE DEPARTED TREES



of the large forests. Already the hunter and trapper must go farther and farther from the abode of civilization to procure skins to keep my lady from the chill blasts of winter, and we have witnessed the price of fur coats run as high as three and four hundred dollars. For the sake of the animals themselves the forests should be replanted. If any there are who plead for the conservation of forests above others they are the dumb creatures of mountain and jungle who depend upon deep seclusion for reproduction and for protection to themselves and their young. One magnificent mountain range in New Hampshire is now being clipped of its trees as close as a school-boy's head is barbered at the approach of summer. Reverberations from explosions of dynamite heard morning, noon and evening awake the surrounding countryside with a knowledge of the nearby devastation. Herds of deer which frequent these mountains, upon hearing the horrible blasts and upon feeling the very foundations of the hills shake under them, fled wildly to northern slopes only to find another lumber company there before them. Where they are now is a mystery, but that they will become extinct if they cannot reproduce in quiet and security is a certainty.

It is one of the inconsistencies of man that he will make laws to protect the deer, surround the partridge with game regulations, compel the fisherman to respect the small fish, and yet allow the ruthless destruction of the home in which these wild things live.

Surrounding one lumber camp in a New England forest instead of deer, rabbit, and fox, there is a herd of forty fat wallowing hogs, some of them too fat to walk with ease. No comparison is here intended between these pigs and the lumber interests sweeping the hills of all that grows, but it is to be noted that the porkers where they root and forage leave no sprout or green thing. It must be said for them that they are ignorant of what they do.

There are other practical sides to the denuding of the mountains that may perhaps best be illustrated by a

personal experience. My wife and I have long desired to visit the source of Cold River, the beautiful mountain stream which runs by our New Hampshire summer home. We have watched it for years go gurgling by, sending cool breezes through our groves, welcoming to its arms our own incomparable trout brook; and many and many an evening as we have sat under the grand old pine tree which canopies and carpets the entire front lawn of our cottage we have listened to the music of rushing waters as the river danced on its way to Bear Camp Water in the region made immortal by the poet Whittier, who spent his vacations here.

Of late we have imagined a new note in that music, a troubled murmur, a complaint as of some hurt thing crying from its wounds: the ripply laughter seemed less gay, and the happy gushing labored and full of pain.

"Let us climb to its source," exclaimed my wife one evening as we listened to the cry of the river which was surely growing faint from lack of volume. "Let us find the very beginning and learn what is going on in those upper secluded regions where clouds and mountains meet four thousand feet above sea level."

Plans were quickly made, and the next morning with knapsacks packed for a several days' trip we two, as in the fairy tale, started to find where the river began.

And then came the tragedy of our adventure.

Where had been the most wonderful spruce forest known to New Hampshire we found the trail had disappeared beneath huge piles of tree tops and underbrush, ready for some careless cigarette or axman's match; then there came a blast, followed by another and another until the mountain rang and reverberated, booming from one hill to another like a general artillery engagement. We knew then why trout were scarce in the river, and why we had seen no wild creature as in past excursions. Vast areas of this Eden we found stripped of its leafy denizens, the carcasses of which were rolled high on platforms waiting the mountain cars to carry them to a mill fifteen miles down the mountain. One stump we



STUMPS WHICH TELL A SAD TALE OF RECKLESS WASTE IN LUMBERING

examined gave a record of three hundred years's growth. Its life had been parallel with the white race in America, and proudly it had watched the progress of a great democracy. But soon it would no doubt, make flooring for some jazz-hall where careless youth "shimmied" and "pivoted" in bacchanalian glee. Surely a fall of spruce if not of man!

The higher we climbed that mountain the more distressing grew the sight. The forest was being lumbered clean, because, as the lumberman explained, the hill-sides were so steep that the only practical method of getting out logs was by rolling them down the mountain.

Poor spruce, I knew them, Horatio, the glories of America, and now "to this favor have they come;" to be knocked about by axes and kicked down the granite steep. Immortal trees, dead and sent to mill, may make a page to hold some grocer's bill.

Soon we had an answer to the river's mournful song. One of the upper tributaries came plunging down to the mother brook as though pursued by some terrible and unnameable thing. In the place of cold pure mountain water the flow was muddy with filth and pollution from a lumber camp above, where a hundred and fifty men made the cataract their sewer. Another branch we discovered flowing through a quarter of a mile of open timberland which had been logged, and where the sun's pitiless rays had dried moss and roots to parching. The stream was almost dry in its bed. It was here we saw with our own eyes the doom of Cold River and its many tributaries. It was not difficult to picture the stagnant mill-wheels, and to understand what the destruction of the forests will mean to the entire country, with its millions of white-coal horse power dead.

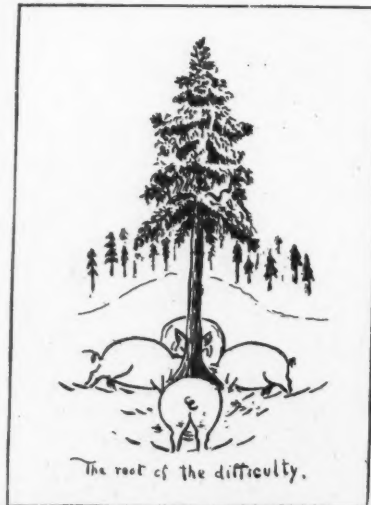
On the noble shoulders of the mountain no new garment is being thrown. Of all the cloth woven in the

merry mills where looms take their power from rivers with their sources in the mountains, not one yard can be spared to protect the father of the waters from the heat of sun, and the tempests of winter. Reforestation has hardly entered the heads of those great mill corporations distributing millions of dollars among their stockholders who depend for their living on Cold River and other streams like it. One tree stands above all others as valuable for this conservation of water.

It is well known to those who read and think that the spruce produces a network of roots with many small fibers which act as a sponge for all moisture. It is due to the spruce forests that streams rising in the mountains keep fairly even throughout the season, but with the spruce gone, we may expect parched river-beds through the dry season, and to find them filled to overflowing with torrents immediately after a heavy rain or a season of melting snow.

Why a government allows all this ruthless destruction with no laws and regulations for replanting as in older countries is the present mystery of a prosperous country. There are European critics who maintain that America with all its intelligence, its public schools, and its high average of literacy, is, after all, too ignorant and too shortsighted to conserve natural resources, and use intelligently such products as nature has furnished abundantly free of cost.

Macbeth was told by the witches he need not fear for his life until he should see Burnham Wood approaching. Shakespeare, were he still mighty with his pen, could easily predict for the United States unparalleled prosperity until that day when the last of the forests should be sighted on its way to the city! Then, indeed, disaster awaits us with our "rocks and rills, our woods and templed hills."



FATTENING AT THE EXPENSE OF THE
YOUNG FOREST

ENGLAND ACKNOWLEDGES GIFT OF SEED

THE following letter has just been received from Lord Lovat, on behalf of the English Government, following the arrival of the forest tree seed recently sent to England by the American Forestry Association:

"It was with great pleasure that we received your letter of December 23, which accompanied the generous gift of Douglas fir seed presented to us by your Association.

"It was very good of you to remember that we especially desired the green Douglas fir, and we shall certainly be able to put the seed to good use in our nurseries. The

trees which we shall hope to obtain from our sowing will undoubtedly assist us materially in restocking areas which were so largely cut over during the war.

"It is particularly gratifying that the good feeling expressed by your Association should take such an appropriate and practical form. I assure you that your good wishes are most heartily reciprocated, and that the trees which result from your gift will long remain as a reminder of the cordial relations which exist between the two countries."

WASHINGTON SCHOOLS VOTE FOR THE OAK AS THE NATIONAL TREE

FOLLOWING an educational campaign of three months by the Nature Study Department of the Washington, D. C., public schools, in which the Washington Evening *Star* co-operated, the grade pupils voted by a big majority for the oak as the national tree in the referendum which the American Forestry Association is taking throughout the country.

A tree work exhibition closed the educational campaign. This was put on at the Wilson Normal School, under the direction of Susan S. Alburdis, of the Nature Study Department, and was attended by such crowds for a week that it was continued for three days more.

GOOD WORK, SAYS REED

I wish to congratulate the American Forestry Association on the interest that is being aroused among the school children of the country in forest trees. I see frequent reference in the papers to the vote for a national tree now being taken. I had the pleasure of hearing a dozen or so speeches by eighth grade students at the Wilson Normal School in behalf of their favorite trees, and I was very much interested in the tree exhibits in the upper rooms which were then open to the public. Some most excellent work is surely being done.—C. A. Reed, Bureau of Plant Industry, United States Department of Agriculture.

Dr. F. W. Ballou, the superintendent of schools, then ordered the exhibition to be held intact until more than a thousand school superintendents came to Washington from a convention at Atlantic City to see the work of the pupils.

Too much praise cannot be given Mrs.

Alburdis for her work

in co-operation with the Association and to the Evening *Star* for keeping the news of the campaign before the people of Washington and also for printing the official ballot. Mrs. Cary T. Grayson, wife of Admiral Grayson, the physician to President Wilson; Mrs. Newton D. Baker, Congressman B. H. Snell and Dr. R. W. Shufeldt were on the committee that visited the exhibit on behalf



National Photo.

COUNTING THE BALLOTS CAST FOR A NATIONAL TREE BY THE CHILDREN OF THE DISTRICT OF COLUMBIA

Nature study teachers of the schools counting 18,000 ballots from the Washington *Star* which were cast for the choice for a national tree in the referendum being taken throughout the country by the American Forestry Association. Mrs. Susan S. Alburdis is directing the count. At the right is Mrs. E. K. Peebles, who brought in a satchel of ballots from various schools. The tree work exhibition at Wilson Normal School was open for ten days and nights because of the big crowds. Dr. F. W. Ballou, the new superintendent of schools, has ordered the exhibition held on display for a thousand visiting school teachers from various parts of the country who are coming to Washington.

of the Association. With the tree voting was incorporated bird house building, and for the best bird houses the American Forestry Association awarded blue ribbons.

The voting, which was canvassed by the teachers of



National Photo.

TWO BLUE RIBBON BIRD HOUSES

Jack and Peggy Baker, who with Mrs. Newton D. Baker, attended the tree work exhibition at Wilson Normal School in Washington, pick out the bird houses that suit their fancy. Jack entered a feeding station in the competition, which was awarded a blue ribbon.

the Nature Study Department before being turned over to the Association follows:

Oak	7075	Hickory	1099
Elm	3892	Dogwood	676
Pine	1935	Tulip	332
Maple	1411	Walnut	273
Apple	1176	Sycamore	108
Scattering	36		

In this campaign, which is being used as a model in many parts of the country, the pupils studied the values of the trees and "four-minute" speakers were assigned by each class to speak for their favorite trees in the different schools. Tree characteristics, uses, diseases and habits were taken up in detail and discussed and argued by the various classes before the vote was taken.

At the exhibition could be found in miniature samples of hundreds of things made of wood. An oak shelf of books with six "volumes" and each "volume" containing something from history or literature in regard to the oak had been made by a class of girls. Each volume was handwritten and the shelf brought much favorable comment. Telegraph poles, an electric lighting system and wooden fences along a road was the exhibit of two boys while another had made a model to scale of an ocean buoy. Farm tools in miniature, made from hickory, completed another exhibit and there were dining room

sets, bedroom furniture and models for boats made from various kinds of wood.

The campaign in the Washington schools resulted in the newspapers publishing many articles about it and this in turn resulted in many editorials. The Portland *Oregonian*, in a column, argues on behalf of the Douglas fir for a national tree, while the Cleveland *Plain Dealer* nominates the hickory. The Baltimore *American* pleads for the oak. The Indianapolis *Star* says, "If the choice of a national tree should result in a new and more general interest in our forest growths, then it should be



National Photo.

PLACING A WINNER

One of the first bird houses awarded the blue ribbon by the American Forestry Association was presented to the Association and placed in a tree in front of its new headquarters, 1214 Sixteenth Street, Northwest, in Washington.

worth while," which, of course, is exactly what the Association is aiming at with the coming generations.

One of the interesting developments of the campaign was a letter from President Woodrow Wilson saying that because of the "richness and infinite variety of America's forests" he was unable to make a choice of a national tree, and this resulted in editorials from such



National Photo.

SOME OF THE BLUE RIBBON WINNERS

Mrs. Cary T. Grayson, a member of the Association, and wife of Admiral Grayson, physician to President Wilson, pinned some of the blue ribbons on the boys who built the best bird houses. Mrs. Grayson spent two hours at the show and visited every exhibit.



National Photo.

FATHER OF THE FORESTRY BILL AWARDS BLUE RIBBONS

Bertrand H. Snell, Congressman from New York State, who introduced the Snell Forestry Bill in Congress, awarded some of the blue ribbons for bird house building by the pupils of the Nature Study Department of the schools of Washington. As the picture shows, girls are just as good home makers for the birds as the boys, and many of them were in line for the blue ribbons.

papers as the *Brooklyn Eagle*, the *New York Evening World* and the *Newark Star-Eagle*.

The *Columbus Dispatch* comments on the campaign and calls attention to the fact that the "hickory is spotless in its Americanism." The *Boston Post* has leanings for the elm. The *Philadelphia Press* points to the educational possibilities of such a campaign as the Association is conducting and adds that the yellow pine or the Douglas fir should win on strict practicality. The *Rochester Democrat and Chronicle*, which is co-operating with the

congratulate everybody connected with the campaign and to thank every pupil who worked so hard in digging out facts for "four-minute" speeches or in preparing their part of the wonderful exhibits that thousands saw and that hundreds of teachers from afar have examined.

THE MEMORIAL TREE

The living monument is Light,
True emblem of our Liberty;
'Tis Faith and Hope and Charity;
'Tis ever Youth, gay, strong and bright;
'Tis heartbeats, Death's decree despise;
O'er Death it is a Victory;
The life of man is called a tree
In Holy Writ; and when its flight
A soul has taken to its rest,
And when a form is but a clod,
That monumental tree is best
Whose great limbs shower on the sod
Its fruit, as would good deeds attest,
To feed the little lambs of God.

—Marta Scott Conser.



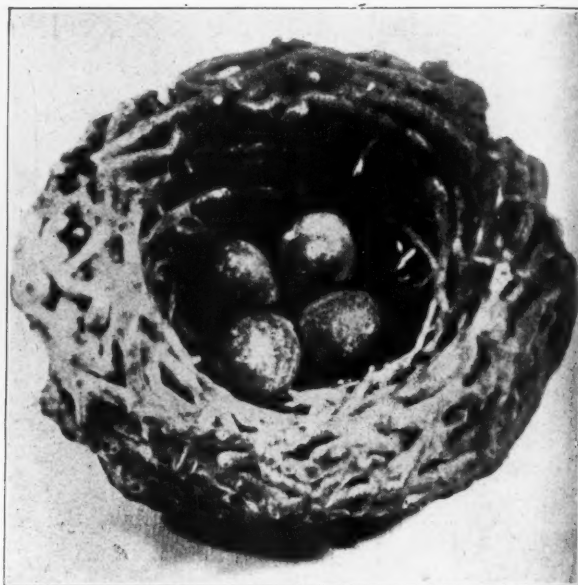
National Photo.

LEARNING THE SECRETS OF BIRDLAND

"That's where the bird comes out," said one of the youngsters who visited the "bird corner" in the tree work exhibition of one of the Washington schools. The exhibition closed a three months educational campaign in which the children voted for a national tree.

Association in a campaign in Rochester, says "there is real merit in this movement for a national tree even if it did no more than make a large number of people study trees." The *Public Ledger* of Philadelphia points out that "the American Forestry Association will give real service if it will advise what not to select so as to eliminate a foolish catalogue of unmeaning shrubbery and trees." The *Public Ledger* then goes on to take up the values of the elm, pine, hickory and several other trees.

Thus it will be seen that the school pupils of Washington through their Nature Study Department have put the subject right before the editors of the country and that of course means putting it before the people of the country. The American Forestry Association wants to



PETRIFIED BIRD'S NEST

PETRIFIED BIRD'S EGGS HAVE BEEN FOUND ON SEVERAL OCCASIONS, BUT, SO FAR AS CAN BE ASCERTAINED, IT REMAINED FOR A WASHINGTON STATESMAN TO FIND A BIRD'S NEST AND EGGS PETRIFIED, IN THE GRAND CANYON OF THE COLORADO, IN ARIZONA, 550 FEET FROM THE BASE OF THE CANYON. IT WAS IMBEDDED IN A ROCK FORMATION IN A SORT OF CLIFF. IT IS EVIDENTLY THE NEST OF SOME BIRD ABOUT THE SIZE OF A ROBIN. THE UNIVERSITY OF WASHINGTON PRO- NOUNCES IT THE FINEST SPECIMEN OF PETRIFIED FORMATION THEY HAVE EVER SEEN. THE DARKER PORTION OF THE NEST WAS THE SIDE EXPOSED TO THE AIR.

CANADIAN DEPARTMENT

BY ELLWOOD WILSON

PRESIDENT CANADIAN SOCIETY OF FOREST ENGINEERS

THE outlook for further progress in the utilization of forest resources in Canada and for better fire protection is bright. The public consciousness is becoming awakened to what Mr. Lane-Poole, Chief Forester for West Australia, calls the slogan of the "Sustained Yield." The public in Canada are asking what is being done to see that their forests shall be kept in a productive condition for all time and that the extremely important industries which are dependent on them, shall be assured of a sufficient supply of raw material for all time to come. The pulp and paper industry has reached very large proportions in Eastern Canada and is rapidly developing in the West. Located, as the mills are, far away from other centers of population and often in the wilderness, they must make their own towns, and many of these from 2000 to 8000 in population have grown up and are thriving. They are all dependent upon sustained yield from our forests and we must see that these towns are protected and will not be abandoned in from 35 to 60 years by the burning or overcutting of the woodlands. Fire protection has improved very markedly in the last five years but is far from satisfactory as yet. On the Dominion Forest Reserves it is good, in British Columbia it is fair, in Ontario there is much need for improvement, in Quebec it is good, in New Brunswick good and in Nova Scotia poor. One of the worst things with which Canada has to contend is the situation on the Canadian National Railway lines which are operated by the government. Those sections which do not come under the jurisdiction of the Dominion Railway Commission continue to set fires from year to year and appeals to the Department of Railways have not met with the response which one would expect from officials whose duty it is to look after the interests of government property. Thousands of cords of pulpwood which should have supplied these roads with tonnage for years have been carelessly burnt and the time has come when the public must force some action looking to the removal of this menace.

Little definite information is as yet at hand about the location and condition of the forests. The areas are so large and so difficult of access that very little even of reconnaissance has been done and accurate maps are almost lacking. The use of the aerial photography has been demonstrated to be practical and sufficiently accurate for determining areas in timber, areas burnt, drainage, areas cut over, etc., and the Dominion Forest Branch, the

Commission of Conservation, the Provinces of Quebec, British Columbia and Ontario, are all going to do this work in co-operation with the Air Board next season. Three private paper companies will also carry on this work and inside of a very few years we shall be able to state with considerable accuracy where our timber is located, and the areas and conditions of stocking, with much other valuable information. Once the question of supplies, that is the amount of our forest capital, is determined we will be able to say definitely how long our timber will last and we can then make definite plans for proper management. To go on longer with the present fire loss and the absolutely planless method of timber exploitation is little short of criminal.

At a meeting held recently with the Premier of Quebec by the Quebec Limit Holders' Association, the question of a diameter limit cutting regulation was discussed. For years Quebec has been requiring a diameter limit in its cutting regulations but it was uniform over the whole Province which, when we consider that the Province extends from latitude 45 to latitude 56, is absurd. The diameter limit was imposed under the theory that small trees were necessarily young trees and if left in the woods would grow up and form the next crop. This has been demonstrated to be absolutely untrue, as most of the smaller trees are suppressed and in reality older than the larger ones and with the large ones removed they do not recover but only cumber the ground and more often than not blow down. The diameter limit has made us feel secure and still gives a false sense of security. Over many large areas, if the government diameter limits are strictly observed, practically no timber can be cut. The government has decided that where permission is asked government forest inspectors will look over the ground and if, in their judgment, cutting undersize would not be harmful, permission is given. While good in theory this method can easily lead to trouble. It opens the door to graft, there are not sufficient inspectors to do the work properly or to see that their orders are properly carried out. It would seem as if the only way to handle this until the government has sufficient trained men for the work, would be to establish a system of zone diameter limits which would be fixed according to the size of the timber. Under the system of permits to cut under size the inspectors often lack sufficient experience or judgment to decide such ques-

tions and sometimes do not know the difference between white and black or red spruce which have different regulations for cutting. It seems as if the best way to handle the matter would be by some system of clear cutting in strips or areas small enough to be seeded in from the sides.

However, the greatest menace at present to the future of Quebec's forests is the way the cutting is done and the fire danger from the slash left in the woods. For the most part the areas to be cut are chosen from year to year by men who are not familiar with the ground and who lack technical knowledge. Their only idea is "Where can the logs be cut and delivered the cheapest?" The jobber system has been responsible for enormous wastes, but owing to the high prices asked by jobbers and the realization of how their lands have been butchered this will gradually disappear and cutting will be done by company camps. Heretofore the cuttings have been in the best timber and only the best and most accessible of that has been taken, so that year by year hauls have become longer, costs of operation higher and the areas still to be cut poorer. It is high time that intelligent plans were made for logging, not for one year ahead but for the next ten years.

The debris from cutting is a serious fire hazard. When areas cut over each year were small and scattered this did not matter so much, but with the large increase in the number of pulp and paper mills and the increased demands on the forests, the cut-over areas are assuming large proportions and are getting nearer together. Experience has shown that nearly all the serious fires are on cut-over or burnt-over lands and such fires are always the most difficult to extinguish and do the most damage. Should a very dry season with high winds come some disastrous fires might occur destroying large areas of valuable timber. The only insurance we can have against fires of this character is to dispose of the debris at the time of cutting by burning. Two objections have been raised to this method—the first that of cost and the second that such burning would kill a lot of the young growth. The first objection is not valid if all operators are compelled to so dispose of their debris, as the burden would fall on the customer. It is also said that if one Province imposed such a restriction it would put operators in that section at a disadvantage with their competitors in

(Continued on page 177)

EDITORIAL REVIEW IN WHICH WE HAVE

IN the opinion of the editor of the *Lumber World Review* the American Forestry Association "clutters up the public mind" with its tree voting campaign in which the public is asked to name a national tree. Since he stands alone we quote from that paper: "Which is the most popular tree? No, the above is not our question. The autumn Indian Summer is not our silly season. The American Forestry Association it is that has started a national tree voting campaign to elect some one tree as the national tree for the entire country. Now, as a matter of fact, anyone who is intimately acquainted with trees has never selected any one tree as his exclusive favorite, unless it was the Irishman who had been sentenced to be hanged and was given an opportunity to state what species of tree he preferred for the ascension ceremony. He promptly chose a gooseberry tree for that purpose,—and probably for a sounder reason than any of the people will have for their choice, who cast votes in this contest. This is merely one of the popular 'stunts' which clutter up the public mind and prevent it doing needed serious thinking upon really important subjects."

The *Lumber World Review* has missed the point entirely, our question not being what he says it is. The question is as to a national tree. A campaign of education as to tree values to the commercial life of the country is

on throughout the schools of the land. The District of Columbia schools have just finished a three months' study of the tree values after which thousands of votes were cast. Orators stood forth in the schools and spoke for votes just as for candidates

in a political campaign. What boots it if the entire thought of the nation can be turned toward the value of forests to our commercial life at this time? Campaigns of the American Forestry Association are calling forth editorial comment on the beautiful things in life. The editor of the *Baltimore American* has just written "The Age Old Oaks," which will rank as a classic with "Yes, Virginia, There Is a Santa Claus" which appeared in the *New York Sun* years ago. The Hall of Fame for Trees with a history, and Roads of Remembrance are having their part in drawing the attention of the public to tree values. At least so the editors think and write. As to the way we have "cluttered up" the editorial minds we again quote:

Rochester Democrat Chronicle:
Latest of the numerous methods employed by the American Forestry Association in its aggressive and highly commendable campaign for forest conservation is a proposed vote on a national tree. This vote is not to be confined to adults, nor is it to be limited to school children, but all are asked to take a part in it. Just now the particular attention of the children is invited, for the school year is opening and this is a good thought for them to take up in connection with their other studies.

There is a real merit in this movement for a national tree. Even if it did no more than make

THE GOOD OF IT

Boston Globe—A shoemaker naturally thinks there is nothing like leather, but a bright idea is a bright idea, no matter who fathers it.

The President of the American Forestry Association suggests that memorial trees be planted along the highway from Sagamore Hill, Long Island to Chicago, in honor of Theodore Roosevelt. The trees could be planted by towns, associations and private citizens, and might be of whatever variety was best suited to the region.

The plan has a good deal of merit. It would be useful—a living, growing memorial. It would be an echo of the conservation policies sponsored by Mr. Roosevelt, and of which the country still stands sorely in need. And—if such a suggestion carries any weight—such a memorial would be beautiful.

Whether it is carried out for the Roosevelt highway or not, the idea is worth remembering for humbler occasions and resources. The expense is not great, and the rewards are cumulative. There is as much difference between a road with a fine shade-row lining both sides and one without as there is between a flat lowland and a splendid mountain landscape. The shade-row is a mercy to man and beast, and such cathedral naves of elm and maple are the glory of our finest New England towns.

An old farmer, past his 80th year, was setting out a long row of maples by the road which passed his meadows.

"What are you doing that for?" asked a neighbor. "You'll never get any of the good of it."

"That's not my idea," replied the old man quietly.

There the trees stand to this day, taller and more beautiful each year that passes, and the pride of the town. The enjoyment of the passers-by is a living monument to the planter. That is the good of it.

"WONDER WHAT A DISCARDED TREE THINKS ABOUT," ASKS

OUT I GO! THIS IS THE END - BELIEVE ME I'VE HAD A GRAND TIME FOR OVER A WEEK



I CAN'T COMPLAIN OF COURSE BUT IT DOES SEEM UNKIND AFTER ALL THE PLEASURE I'VE GIVEN TO EVERYBODY - TO BE THROWN OUT THE BACK DOOR IN THIS HUMILIATING FASHION



WELL - HERE'S A KID I NEVER SAW HERE--HE SEEMS SO VERY RESPECTFUL AND SYMPATHETIC



HE LIKES ME! IT SEEMS GOOD TO BE LIKED BY SOMEBODY AGAIN--



"CLUTTERED UP" THE MINDS OF SOME EDITORS

a large number of people study trees, their natures and range of growth geographically, it would be of inestimable benefit. And if, in addition to this, they should learn that the forests of the country are in danger of rapid extinction the value of the study would be doubled.

Study of the subject will be demanded of those who enter this voting contest, for they are expected to give reasons in writing for voting for their particular trees. Naturally the selection of a tree that will appropriately represent the American spirit as far as a tree can will be no small task.

Portland Oregonian: The American Forestry Association's attempt to "elect" a national tree evokes thoughts of the difficulties attending the task. Yet if it fulfills no other purpose than to inspire study of the value of trees and the part they play in our natural economics, it may be worth while. To choose a tree that will represent all parts of America would be a practically impossible task.

The editor of the *Oregonian* then "clutters up" the mind of his readers with the history and value of the Douglas fir suggesting that tree be the candidate of the Northwest.

Philadelphia Public Ledger: It is to be hoped the American Forestry Association will get better results out of its very commendable effort to get the country to select a national tree than other associations got in the past in trying to select a national flower. If the analogies represented in the selection of state flowers be followed in the voting on a national tree, one sees all kinds of breakers ahead, since, with a few excep-

tions, wherein indigenous and characteristic flowers have been selected which have size, color and design as well as popularity, many of the states have chosen flowers that are absolutely meaningless or childish in the extreme.

With these untoward precedents in mind, the American Forestry Association will give real service, therefore, if it will advise what not to select, so as to eliminate a foolish catalogue of unmeaning shrubbery and trees. There is, however, no trouble about the splendor and beauty of tree life peculiar to and belonging to the United States, though by reason of climatic and topographic necessity not all these new world species have a universal range. Hence it would be out of the question, perhaps, to accept the redwood or the sequoias as our national emblem, though they are the most magnificent trees in the world and absolutely our own. The various magnolias are indubitably American and have a large, though not universal, habitat over here, and so would naturally be ruled out. The hickory, also one of our most characteristic trees and native to the very bark and leaf, might well come in for selection. The common elm will occur to many as a proper emblem, although our own elm belongs to a widespread genera not confined to the New World. It is, however, wholly different from the English elm, and its loose, pendulous characteristics, with the graceful soar and spread of the limbs in a fan-like manner, combined with its endurance and its strength and size in the finest examples, are quite American and in marked contrast to the stockiness and sturdiness of the English elm which is sometimes seen growing near the American

elm in formal gardens and parks, yielding the palm to its American congener so far as a shapely symmetry of outline goes. No one who has ever seen a characteristic tulip-poplar in bloom in June in all its glory of fresh foliage can forget the supreme impression of vigor and beauty that makes it easily an appropriate emblem of a great people.

Clinton (Ia.) Advertiser: It is to be hoped that this appeal for an expression of opinion in the matter of a national tree will meet a ready and general response. Every citizen should be interested in the matter and take the time to make an intelligent decision, and then express it. What tree, in your opinion, best expresses the spirit of America, and in what manner does it do this? Tell the American Forestry Association.

Philadelphia Press: To the practical-minded, the American Forestry Association's attempt to "elect" a national tree, as a symbol of these United States, may seem like a specious and insignificant gesture. "What is the use of bothering busy people with such questions?" might be the natural query. But the contemplated drive for votes, inclusive of citizens of voting age and of school children, has a point that should not be overlooked. Its achievement will be fully worth the incidental trouble.

If a test of strict practicality were applied to the "election," no decorative trees would win. Instead, we might get the useful and wealth-producing yellow pine, which in recent years has been the leader in lumber production, or the almost equally productive Douglas fir of the Northwest. But

MR. BRIGGS, THE FAMOUS CARTOONIST OF THE NEW YORK TRIBUNE



these trees, like the rest, represent only sections of the country. What is wanted is a concrete type of American aboriculture, inclusive of Maine, and Yellowstone Park, as well as California and Florida. Probably the nearest approach to such a type is one of the conifers. At all events, the "election" promises to be interesting and variegated.

The *Plain Dealer* of Cleveland nominates the hickory as the real American tree and then "clutters up" the minds of his readers with a double column editorial on the hickory's virtues of which this is a part:

Cleveland Plain Dealer: Shall America adopt a national tree? The American Forestry Association says it shall, and is conducting a plebiscite to determine the selection. Schools, civic organizations and other bodies interested in Americanism and in conservation have been asked to vote, and already the balloting has become spirited.

The *Plain Dealer* nominates the hickory. This is a distinctively American genus. It is indigenous nowhere but in North America, but it is found in almost every section of the United States. There are many species, some with edible fruit, and some, otherwise equally desirable, which bear nuts unfit for human food. The hickory is sturdy, and not ungraceful. Its flowers are inconspicuous, but the opening of its immense leaf buds in the spring presents a mock-floral display more gaudy and colorful than even the tulips, or liri-dendron. Hickory wood is noted for its toughness and elasticity. And what wood-farer does not cherish memories of the

fragrance and merry crackling of a fire of hickory bark?

The hickory! Let the sturdy aborigine, the shaggy monarch, the "artist" tree, the tree of uniquely American qualities, be chosen as America's arboreal emblem!

A column editorial "clutters up" the *Salt Lake Tribune* with a review and opinions of other editors and then concludes:

Salt Lake Tribune: Whether or not the Forestry Association succeeds in obtaining so decisive a vote in favor of one or another tree as to make it the pronounced choice of the American people, the effort undoubtedly possesses much of merit. This merit lies not altogether in achieving the aim of the undertaking—the selection of a national tree—but also in its educational value in creating an interest in our woods on the part of school children. This is certainly worth taking into consideration. The same may be said for various clubs, whose adult members probably have, for the most part, never learned much about America's trees, and those of them who learned anything at all about them in their youth have forgotten that little.

Denver Times: Selecting a national tree is as difficult as choosing a national flower, at which all attempts have thus far failed. So many noble trees grow in this country that it is doubtful if a majority of voters will settle on any one. The interest that the contest is arousing in our forests and the problems connected therewith will be of considerable benefit, however, even though no tree is elected. Encouragement of school children to take an interest in the matter and discuss trees and forestry in

general is an excellent idea. The next generation will be thoroughly grounded in the principles of conservation and development.

The tree that is selected should be emblematic of the American nation—strong, straight, staunch, enduring—and should grow in most, if not all, of the States. To vote intelligently will take considerable study and thought.

Watertown Standard: What is your favorite tree? The American Forestry Association is taking a vote to find which variety is most popular and to call that the national tree. So far returns are incomplete and the voting remains open to anyone interested enough to write his choice on a piece of paper and mail it to the Association.

Late reports show that the walnut is leading in the vote up to date. This may be like some straw votes in political campaigns, but it evidently does show a stronger trend in the direction of that tree than might have been anticipated. Possibly one reason for this is the wide advertisement given to the fact that the walnut came close to the danger line of extinction during the war. It will be remembered that there was urgent demand for walnut timber for military use, and as a result information was spread showing how little was left when the hunt began. What must have happened to the small stock when the ruthless demands of war had been satisfied may be imagined with ease. For this reason it would not be a bad idea to center interest on this valuable tree during the vote, even if in the end the choice should be some other variety.

Financial Statement of the American Forestry Association for 1920

EXPENSES		INCOME	
Publication of Magazine.....	\$ 31,344.87	Membership and Circulation.....	\$ 55,490.44
Membership Solicitation.....	23,834.15	Advertising	11,076.23
Editorial and Business Office Expenses,		Books and Premiums.....	438.90
Salaries, Supplies, etc.....	33,573.39	Donations for Educational and Scientific	
Educational and Scientific Publicity.....	8,539.86	Work	19,689.09
Meetings and Legislative Activities.....	1,325.11	Bequests.	5,613.51
Equipment, etc.....	1,687.50	Interest	1,512.21
		Sale of Equipment.....	275.00
	<u>\$100,304.88</u>		<u>\$ 94,095.38</u>
		Excess of Expenses over Income.....	\$ 6,209.50
			<u>\$100,304.88</u>

CANADIAN DEPARTMENT

(Continued from page 173)

another Province. This also is not so as at present the stumpage dues in the different Provinces are different but this does not seem to affect trade. The objection that too much young growth would be killed is not true, as for three years one company has been burning all brush in thinning and clear cutting operations and the amount of young stuff killed is entirely negligible. The method employed is to start a small fire and then have a man with each two cutting gangs who take the branches and tops as fast as they are cut and lays them on the fire. The area covered by the fires is usually about eight feet in diameter and here the burn is down to the mineral soil and after two years these burnt spots are covered with tree seedlings. The damage done to young growth is far less by burning the slash in piles than when it is left to rot on the ground.

The annual week of meetings of the Canadian Pulp and Paper Association was held in Montreal at the Windsor and Ritz-Carlton Hotels. On the 18th the Canadian Society of Forest Engineers held an all day meeting; on the 19th the Quebec Protective Association and the Woodlands Section held a joint meeting; on the 20th the Canadian Forestry Association held an all day meeting and on the 21st the joint meeting of the various sections of the Canadian Pulp and Paper Association was held, with the annual banquet in the evening. This was a week of thoroughly practical and very interesting meetings, and the fact that George Chahoon, Jr., is president of the Canadian Pulp and Paper Association insured a very interesting and enjoyable banquet. The program of the Canadian Society of Forest Engineers was a most interesting one.

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BECAUSE THESE AND THE OTHER MEASURES IT PROPOSES WILL RESULT IN SUFFICIENT FORESTS TO PROVIDE OUR NATION WITH AMPLE LUMBER, PULPWOOD AND OTHER PRODUCTS OF THE FORESTS.

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WOODCHUCKS AND PORCUPINES

(Continued from page 154)

anything that comes their way; so, of all the animals of the forest, they run the least risk of dying from starvation; in fact, a good, healthy porcupine probably never knows what hunger means.

Young porcupines are not any handsomer than their parents; and all round, there seems to be but little affection among them. When an old one goes to sleep in its nest—be it in a hollow tree or log—it has a way of effectively closing the entrance by literally backing up against it. The quills on that part of its body being the largest and strongest, it is not likely to be molested by anything living while in that position. Notwithstanding their general clumsiness, they are excellent climbers, and it is remarkable to see how rapidly a porcupine can get up into a rough-barked tree, in a minute or so he will reach a height of some seventy-five or eighty feet from the ground.

The most marked peculiarity of the porcupine are the quills, which are simply thickened hairs—gradations between ordinary hairs and the thickest and longest spines exist to prove this assertion. Occasionally the spines end in a peculiar, cup-shaped extremity. The armature of spines is of the greatest value to the animal, though its use is entirely for defensive purposes. As a usual thing, the western porcupine does not attain a large size. West of the great Rocky Mountains these animals are met with in great numbers in certain regions, and in some localities in Wyoming the porcupine is very numerous. A gentleman who lived one summer in that State said: "I saw, in a week's time in Wyoming, more porcupines than I ever saw before in all my life. During the month of July a party of eight or ten men went out camping; I was along, and our camp was not far from a chain of high, wooded hills. The sides and summits were densely clad with pine, and there was very little underbrush; the trees were all of large size. The entire woods along the base of these hills fairly swarmed with porcupines; they seemed to subsist entirely on the bark of the pines—not the rough, exterior portions, but the soft, juicy parts next to the wood. We found the trunks of the smaller trees and also the limbs stripped clean; all the bark had been peeled off and devoured by these animals. In traversing the woods we saw hundreds, yes, thousands of the creatures, and in most cases we found them busily engaged in stripping off the pine bark; they were not wild, and made no attempt to get out of our sight, nor did they offer to molest us. As there was an army of them, they could have made it interesting for us. We had several dogs along which at first imagined that they had a picnic, and made a general attack on the unoffending porcupines; the latter did not put up much of a fight with teeth and

claws, but let their coat-of-mail do the work. The poor dogs quickly found out their mistake, and dropped the fight in a moment, their mouths being stuck full of quills, the points of which were as sharp as cambric needles, which we had a tedious job in picking out. For several days the dogs could not eat on account of their mouths being sore. Some of the men shot several of the porcupines, and those which were wounded uttered piteous, plaintive cries and moans, almost human in tone. The men desisted at once from the cruel sport. The porcupine seems to have a peculiar taste; if not disturbed it will destroy harness and saddles. One porcupine can

Stone and Cram seem to believe that the sight of the American porcupine is greatly lacking in power; they say, in regard to the Canada species: "He lacks beauty either of form, motion, or color, as well as softness of fur; his eyes are little and dull, with never a glimmer of thought behind them, serving little better purpose than to direct him from one tree to another, and to distinguish between daytime and night." This sounds almost like a description of the eyes of some of the lower semi-sightless invertebrates.

The powerful incisor teeth of the American porcupine are fashioned after the plans of other rodents of the kind. If an accident happens to one or more of them, the sound teeth grow on till they may cause the death of the sufferer. They are bright yellow on their anterior surfaces, and become very conspicuous when the animal grins in anger. Before making an attack, the animal has a way of chattering with them, as though hoping to intimidate its enemy or assailant. On the whole, American porcupines are curious creatures, and we have by no means learned all there is to be known about them. masticate all the leather on an ordinary saddle in a single night."

When stripped of its long quills, the animal is quite small, though sometimes porcupines are found which are very large for the average size of the species.

BEETLES AND PAPER SHORTAGE

A GRAY-GREEN beetle has something to do with the present shortage of paper. The beetle is the adult form of the aspen borer, a grub which often destroys whole plantations of the trees that are so essential to the pulp industry. The beetle gnaws a slot in the bark and deposits one or two eggs therein. From these eggs come the trouble-making grubs that gnaw into the heart and sapwood and so riddle the tree that the first strong wind snaps the weakened timber. Poplar and aspen—both very fast growing trees, and for this reason very valuable to manufacturers—are the objects of the borer's attacks. The imported Lombardy poplar and the commercial cottonwood of the Mississippi Valley are very seldom injured, but all other native varieties are damaged by the grub.

In some areas where poplar and aspen predominate, the standing dead, fallen, and dying trees exceed 50 per cent of the total stand.

The Department of Agriculture experts find that the insect can be controlled, if not entirely eliminated by destroying the insect by cutting the brood trees, and a man with an ax can cut and pile 50 such trees in a day, or by another method, not practical in the forest, but applicable to shade trees, the application of creosote or carbolineum to the egg scars. This should be done in October after the adults have deposited their eggs.

ALASKA DISTRICT

BECAUSE of its increasing importance as a source of paper pulp material, as well as in order to secure quicker administrative results, Alaska has been designed by Secretary Meredith, of the Department of Agriculture as a new National Forest District. Mr. Charles H. Flory, who has been Superintendent of the Alaska National Forests for the past two years, has received appointment as the first District Forester to the Alaska District, as it is now known. Mr. Flory will retain Ketchikan as his headquarters until July next, when he will move to the permanent headquarters at Juneau.

According to the Forest Service there are two National Forests in Alaska, the Tongass, in the southeastern part, and the Chugach, in the Prince William Sound country. These two forests have heretofore been included within the North Pacific District, but now, under District Forest Flory's direction, matters which formerly were referred to the Forest Service office in Portland, Oregon, will be handled within Alaska itself. The establishment of this new District is in accordance with recommendations made to Secretary Meredith by Colonel W. B. Greeley, Chief Forester of the Forest Service, who became convinced last summer that efficient administration as well as the proper development of Alaska's forest resources required the establishment of such a district with its accompanying local administration.

REFORESTATION IN PENNSYLVANIA

A SINGLE application for 240,000 seedling trees has been received by W. R. Ludwig, District Forester in Pennsylvania, in a campaign to have a half million young forest trees planted in his district this spring. This is more than the total number of seedlings applied for last spring. Forester Ludwig also reported that the enrollment of Boy Scouts as Forest Guides is going forward rapidly in his territory. A fire patrol of boys mounted on bicycles for prompt response to fires is another form of boys' organization which is proving successful.

Saving Our Forests

The nation-wide movement to conserve the forest wealth of the country, which is concretely expressed in the Snell Bill, recently introduced in the House, was inaugurated by the paper and pulp interests of the United States.

United in its support are more of the forest engineers, lumbermen, users of forest products and timberland owners than have ever before reached an agreement on a similar policy.

It is backed by the press of the country and the support of the public is looked upon as a foregone conclusion.

It is noteworthy that this concerted and vigorous movement to stay the destruction of the forests, and, by natural or artificial reforestation, to restore the ideal balance between annual growth and annual cut, had its inception in the industry least responsible for the disappearance of our woodlands.

Of the ninety-one billion feet of timber annually cut in the United States, the entire pulp and paper industry of the nation can be charged with only three per cent, and, included in that small proportion, the newsprint paper industry is responsible for a scant one per cent.

Six times as much wood is consumed in making boxes and packing cases each year as is used in all the newsprint paper manufactured in the country.

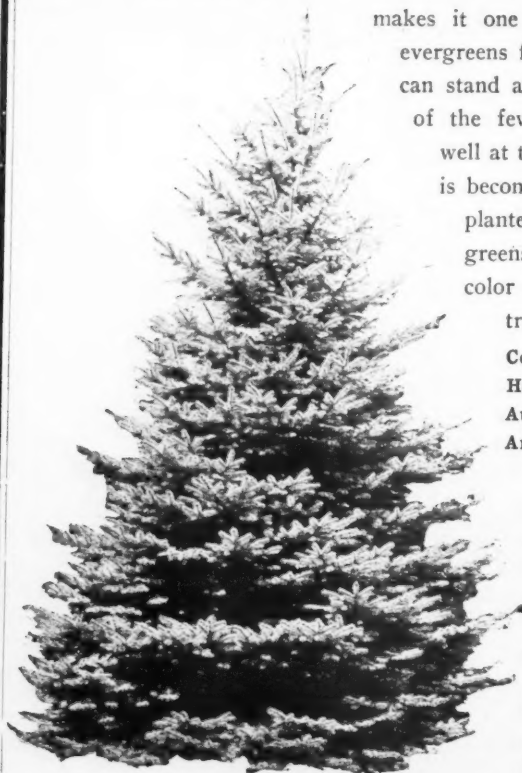
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PLANT JAPANESE WALNUT

THE Japanese walnut offers possibilities for landowners who are seeking to plant nut trees for shade or other purposes, say specialists of the United States Department of Agriculture. It is nearly as hardy as the black walnut and is by no means uncommon in Northern and Eastern States, where it is especially appropriate for farm and door-yard planting. For the present, seedling trees will have to be relied upon almost entirely, as very few budded or grafted trees are available.

This nut has been confused with the Persian or so-called English walnut, although the two are quite unlike. The Japanese is a dwarfish species, with dull green rough leaflets, often as many as 15 or 17 to the leaf, and bears nuts in racemes of a dozen or more.

The shells are thinner than those of the black walnut, but thicker than those of the Persian walnuts. The flavor of the kernels is much like that of the American butternut.

INSECTS ATTACK WESTERN PINE

OF the 10,700,000 feet of yellow pine in private ownership in Klamath and Lake Counties, Oregon, fully 8 per cent has been killed during the past five or six years, or is now infested by beetles, says the Forest Entomologist of the Oregon Experiment Station. The average annual loss has been about 150 million board feet, worth at least \$250,000, or 300 times as much as the average annual fire loss in the two counties.

The principal enemy in the western pine forests is the western pine dark brown beetle which bores through the bark of the tree and excavates long, winding galleries in the soft formative tissue next to the bark. The effect of these hundreds of insect galleries is to girdle the tree, thus cutting off its supply of food and water, and causing death. When the beetles become abundant and kill large numbers of trees, the infestation is known as an epidemic. These epidemic infestations usually run in cycles of from four to six years. The amount of timber killed on a given area while the insects are passing through this cycle may be as low as 6 per cent or as high as 80 per cent.

PLANT CHESTNUT TREES

FIFTEEN years ago an Illinois farmer selected a piece of steep hillside land, unsuitable for regular cultivation, and set out a grove of young chestnut trees. The trees are now giving him as good an income as some farming land, and practically without attention. Chestnut blight, which has destroyed most of the native chestnut trees in the East, has not yet done material damage to chestnut land plantings west of the natural distribution of the American chestnut. Blight resistant varieties are now being developed by the United States Department of Agriculture and by associations of nut growers.

UTILIZATION OF BLACK WALNUT

BLACK walnut, which in the latter part of the nineteenth century was displaced by oak as a favorite cabinet wood, has returned to popularity. This beautiful wood, with its wonderful figured effects, is especially adapted to the dignified designs used in the lighter and more attractive finishes now in common use.

Besides its appearance, black walnut has other qualities which make it particularly good for furniture manufacture, according to the Forest Service, United States Department of Agriculture. These qualities are set forth in Bulletin 909, by Warren D. Brush, which deals with the utilization of black walnut, its properties, supply, demand, methods of marketing, adaptability for the making of veneer, and other uses.

The wood is described as heavy, hard, strong and stiff. Good "shock-absorbing ability" is specified as one of its valuable qualities for such purposes as furniture.

In 1918, about 100,000,000 board feet of black walnut was turned out by the saw-mills. During the war, a tremendous demand for black walnut was created by requirements for gun stocks and airplane material.

As a result of this stimulus to production, large stocks were left on hand at the close of the war, and so, temporarily, the market for black walnut has been somewhat depressed by the accumulated supply.

Black walnut trees grow naturally over a large area, extending from southwestern New England to central Nebraska, Kansas, Oklahoma, and Texas. Some regions in this area are unfavorable for its growth, for black walnut thrives best on soil that is rich, moist, and deep, but not wet.

SAVE THE REDWOODS

THE scenic beauty of the California State Highway through the redwood region of Humboldt County is in immediate danger of destruction, according to the report just issued by the Save the Redwoods League. Unless action is taken by the State to save these redwoods along the Highway, league officials declare that before another year has passed the lumbering operations now contemplated will result in the almost complete devastation of one of the great scenic highways of the world. Support is given by the League to the bill now before the California State Legislature to protect these trees.

The annual report of the Save the Redwoods League, now being sent to members, outlines the comprehensive program followed in 1920 to save representative areas of sequoia sempervirens, or redwood, the giant trees of the Northern California coast which are rapidly being destroyed.



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BOOK REVIEWS

"Studies in French Forestry," by Theodore S. Woolsey, Jr. (John Wiley & Sons, Inc.) 1920.

Perhaps the chief value of this book lies in the fact that the wealth of detailed information which it contains is presented from the American point of view. Whether the subject under discussion has to do with natural regeneration, artificial reforestation, control of erosion, regulation of the cut, forest law, forest policy, or forest economics, the author is obviously trying not only to present a complete and accurate picture of French practice, but to stress those points of particular interest and value to American readers. Among the many interesting points brought out by the book the most striking is the success achieved by the French in making forest conservation a truly national policy, approved of and participated in by the great bulk of the people. As a result it has been possible for France to effect the regeneration of immense areas of forest lands formerly devastated by years of war and other abuse. Other important achievements include the reforestation of eroded mountain lands, including the control of torrents, and the reclamation of the sand barrens of Gascony and the Landes. The story of how these latter were converted by draining and the planting of maritime pine from a fever-ridden, bankrupt waste to one of the most progressive and prosperous regions in France is of absorbing interest.

One of the most striking features of forest conservation in France is the recognition of the forest as a resource standing apart from other resources in its need for extraordinary care and protection. This has led to the adoption of a special penal code for the forests and to the enactment of legislation forbidding the denudation of privately owned forest lands, which constitute 70 per cent of the total forest area of the country. The public forests are in general better managed, produce a higher quality of timber, and by demonstrating good forestry have had a marked effect in raising standards generally.

The first and last chapters of the book "Impressions of French Forestry," and "The American Forest Engineers in France," are contributed by W. B. Greeley, who pays his respect in no uncertain terms to the French people and foresters. He emphasizes particularly the fact that "we may learn much in seeing how a nation just as democratic and individualistic as our own has met a forest situation similar in some respects to that which America is approaching." His account of the activities of the forest engineers in France is a fascinating tale of achievement in the face of apparently insuperable obstacles.

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EASTERN NATIONAL FORESTS SHOW BIG RECEIPTS

THE National Forests of the eastern United States, purchased by the Government for the protection of watersheds of navigable streams, and administered by the Forest Service, United States Department of Agriculture, yielded a gross revenue of \$110,250 in the fiscal year ending June 30, 1920, as against less than \$72,000 the previous year, according to the annual report of the National Forest Reservation Commission. Since 1917 the receipts have

increased by \$88,000, and it is believed that within five years the revenue from these areas will exceed \$300,000.

Of the seven million acres included within the originally located areas in the southern Appalachians and White Mountains, the purchase of 1,796,788 acres has been authorized to date by the Commission at a cost of about 10½ million dollars. The average price paid the owners per acre for forested and cutover lands was \$5.31. The estimated net balance of purchases funds from the original appropriation of \$11,600,000 made for this work by Congress in 1911, is \$445,429.

This year Congress has been asked to make a lump sum appropriation of \$10,000,000 to enable the Commission to continue its purchase program. There is urgent reason for expediting this work. Land values are increasing and, due to the high cost of lumber, cutting is being done much more closely than heretofore, with the resultant increase of fire hazard from the large amount of brush and slash left after logging.

The development of the timber resources and the protection of the forests from fire are the leading administrative considerations in the eastern National Forests. There has also been a remarkable increase in the use of these forests as recreational grounds. To meet this growing demand the Forest Service is providing camping grounds furnished with woods' fireplaces, shelter houses, clean springs and sanitary improvements for the comfort and convenience of visitors. The chief importance of the forests, however, aside from their protection features, is their use as demonstration areas where lumbermen and others interested in wood-using industries can actually see the profits that may accrue from the scientific handling of forest areas.

CIVIL SERVICE EXAMINATIONS

THE United States Civil Service Commission announces open competitive examinations for the positions listed as follows:

Engineer in forest products, \$2,400 to \$3,600 a year; associate engineer in forest products, \$2,160 to \$2,340 a year; assistant engineer in forest products, \$1,500 to \$2,100 a year; chemist in forest products, \$2,400 to \$3,600 a year; associate chemist in forest products, \$2,160 to \$2,340 a year; assistant chemist in forest products, \$1,500 to \$2,100 a year; wood technologist, \$2,400 to \$3,600 a year; associate wood technologist, \$2,160 to \$2,340 a year; assistant wood technologist, \$1,500 to \$2,100 a year.

Applications will be rated as received until May 3, 1921.

Vacancies in the Forest Products Laboratory of the Forest Service, Department of Agriculture, Madison, Wisconsin, or elsewhere, at the salaries indicated, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from these examinations, unless it is found in the interest of the Service to fill any vacancy by reinstatement, transfer, or promotion.

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On account of the needs of the Service papers will be rated as received and certification made as the needs of the Service require.

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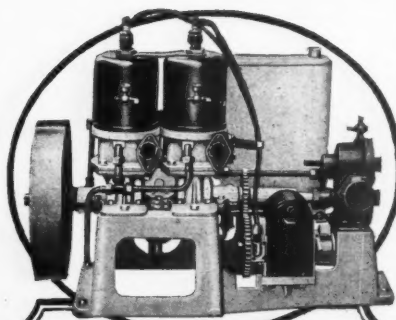


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MICE AND CHIPMUNKS HELP RESTOCK FORESTS

MICE and chipmunks are helping to re-establish the forests of Oregon and Washington, state officials of the Forest Service. Studies made by J. V. Hoffman, Director of the Wind River Forest Experiment Station, Stabler, Washington, have shown that a large part of the young fir growth coming in on burned or logged areas in these States is not due to seeding by occasional trees which are left, but rather from seed buried beneath the duff of the forest floor.

"In the Douglas fir region," states Mr. Hoffman, "the forests produce a heavy seed crop every two or three years. Rodents collect the seed from the cones in large quantities and bury them just beneath the surface of the soil. Part of the seed thus stored away is eaten, but snow and soil movement often covers many of the hordes so that they are never found. When logging operations open up the stand, these seed germinate and produce a new stand of little trees."

The Wind River Experiment Station is but one of several establishments maintained by the Government in the National Forests for the solving of forestry problems. In this particular case many thousands of dollars have been saved annually to western lumbermen through the assist-

ance of rodents in restocking cutover lands. This is one example of the value of the experiments being carried on by these stations, which are so important to the perpetuation of our forests and dependent industries.

The appropriation for these important investigations, which are the backbone of all standard forest practice, although already insufficient, was cut last year by over one-third by Congress. In the Pacific Northwest, \$50,000 annually is needed for this work, and only through adequate funds can much needed results be secured.

ASSOCIATION OF MICHIGAN FORESTERS

A RECENT event of considerable significance in the development of State forestry in this country is the organization of the Association of Michigan Foresters by the technically trained foresters of the State. The first meeting of the newly formed association, which was called by the Michigan State Farm Bureau, went on record in connection with a number of important points including particularly fire protection, reforestation, forest taxation, and the reorganization of the conservation work of the State.

The association emphasized the importance of forest fire protection and urged that sufficient appropriation for a highly efficient fire-fighting organization should be provided by the legislature. It commended the work being done by the various State agencies in the reforestation of state forests and farm woodlands, and the initiation of roadside planting on State highways. In the field of forest taxation it favored substituting for the present method a land tax to be collected annually at the local tax rate on the value of bare land and a deferred yield tax on timber when cut, and appointed a committee to draft more equitable taxation laws. It also favored an immediate soil and economic survey of all lands in Michigan to determine which are better suited for farming than for forestry purposes. In the matter of organization it recommended the formation of a Conservation Department, in charge of a Director of Conservation, to be appointed by the Governor, such a department to include bureaus of natural resources, of State forests and parks, and of wild life. Finally, as a means of crystallizing sentiment and expediting action the Governor was requested to call a meeting of all citizens interested in the conservation of the State's resources and the utilization of State lands, as well as of prominent foresters and others interested from without the State, to consider plans relative to the administration, protection, and utilization of forest lands.

This program, while not complete, contains many important items which should be enacted into legislation at the earliest opportunity. About 20 years ago, when State and National forestry received a

distinct impetus from the work of Roosevelt and Pinchot, Michigan, like others of the Lake States, started out in promising fashion to solve its forest problems. As a result of this movement, Michigan established the policy of reserving State lands and placing them in State forests; organized departments of forestry in the State University and the State Agricultural College, and placed a fairly satisfactory fire law on the statute books. Yet, in spite of this promising start, progress has not been all that could have been wished.

AMERICAN FORESTRY congratulates the Association of Michigan Foresters on having taken an important step toward the advancement of forestry in the State. It is to be hoped that its efforts will be successful in hastening the adoption of a comprehensive and constructive forest policy. In addition to the other fields covered it is also hoped that the association will turn its attention in the near future to devising methods for preventing the denudation of the areas of merchantable timber still left within the State by seeing to it that they are cut in such a way as to secure natural reproduction. One of the cardinal points in the National Forestry program endorsed by the American Forestry Association and now before Congress is maintenance by the States in co-operation with the Federal Government of the productivity of virgin forests and other areas of merchantable timber.

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FORESTERS ATTENTION

AMERICAN FORESTRY will gladly print free of charge in this column advertisements of foresters, lumbermen and woodsmen, discharged or about to be discharged from military service, who want positions, or of persons having employment to offer such foresters, lumbermen or woodsmen.

POSITIONS WANTED

WANTED—Position as City Forester. Technically trained and experienced forester. 30 years old. Have had 5 years experience in city forestry, tree surgery, landscape work. Box 2010, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (2-5-21)

GRADUATE of a recognized forestry school having had several years practical experience in all phases of forestry, both public and private, and experienced in portable logging operations, desires to make a change. Will consider any proposition in any part of United States or Canada. Box 2030, care AMERICAN FORESTRY Magazine, Washington, D. C. (2-4-21)

TECHNICAL FORESTRY GRADUATE, B. S. 1908, M. S. 1914, desires position as City Forester. Twelve years practical experience in tree surgery, planting, transplanting, spraying, orchard care, improvement cuttings and landscaping, including making and execution of plans. Employed at present. References if desired. Married, age 41. Box 2020, care AMERICAN Forestry, Washington, D. C. (2-4-21)

YOUNG MAN, 30 single, technical training and experienced in forestry and engineering, also first-class knowledge and experience in accounting and office work, desires position offering opportunity for the future. Address Box 2000, care AMERICAN FORESTRY. (2-4)

BUSINESS MAN with technical forestry training and experience, a specialist in aerial mapping and patrol, experienced in protection, cruising and administration, desires responsible position. Now engaged in economic study of paper industry. Address Box 980, care AMERICAN FORESTRY, Washington, D. C. (2-4)

YOUNG MAN WITH WOODS EXPERIENCE and college and military training, desires position in connection with management of forest lands on large estate. Address Box 990, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (2-4)

GRADUATE FORESTER, 31 years old, married, ex-service man, wants position as Forester. Private estate or operating pulp company preferred. Have had 10 years experience in forestry work and practical lumbering. Address Box 2040, care AMERICAN FORESTRY, Washington, D. C. (3-5-21)

WANTED—Position with lumber company. Graduate of 4-year college forestry course. Experience in wood technology, and the grading and selling of hardwood and yellow pine lumber. Address Box 2030, care of AMERICAN FORESTRY MAGAZINE, Washington, D. C.

MARRIED MAN 30 years old, energetic, industrious and systematic, with two years training in forestry, wishes permanent position with a paper and pulp company. To begin with is willing to do most anything. Address Box 2055, care AMERICAN FORESTRY, Washington, D. C. (3-6-21)

TECHNICAL FORESTER with considerable experience in various phases of practical forestry and sawmill work, desires position with manufacturing concern in the East or Middle-West. Dry-kiln work, offering opportunity for development preferred. Address Box 2060, care AMERICAN FORESTRY, Washington, D. C.

YOUNG MAN, 36, single, technical trained and practical experience in forestry, tree surgery, landscaping and orchard care, wants to get in business for himself as city forester in an excellent location anywhere in the United States. Will also consider position as forester on large estate. Employed at present and best of references. Address Box 2065, care AMERICAN FORESTRY Magazine, Washington, D. C.

POSITIONS OPEN

WANTED—Assistant State Forester. State of Maryland. Apply to State Employment Commission, 22 Light Street, Baltimore, for full information and application blanks.

WANTED—An assistant forester. Good place offered for a recent graduate who would like to get in business for himself in an excellent location. Address Box 920, AMERICAN FORESTRY MAGAZINE. (8-10-20)

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AMERICAN BOYS' HANDY BOOK OF CAMP-LORE AND WOODCRAFT

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FOREST SCHOOL NOTES

UNIVERSITY OF CALIFORNIA

PROFESSOR David T. Mason is back again after a long absence with the Treasury Department. His course in the Lumber Industry has a large enrollment of students from the College of Commerce and those majoring in Economics as well as the senior foresters.

All the boys are looking forward with much pleasure to the convention of the Intercollegiate Association of Forestry Clubs, which will be held in Berkeley, Tom Oliver, as president of the association, has a number of committees actively engaged in making ready for the big event. It is hoped that there will be a representative present from each of the clubs. One of the features planned for the occasion is the District V, United States Forest Service exhibit, which will be installed in Hilgard Hall. This exhibit is largely the result of the artistic work of Mr. Paul G. Fair, who will be in charge. The Air Service will have on display one of its airplane fire patrol engines and the wireless outfit used for reporting the location of fires.

During the convention trips will be taken to Muir Woods and Redwood Canyon in order that the delegates may see the California redwood in its native haunts. Several of the wood-using industries on San Francisco Bay will also be visited.

Mr. Ansel F. Hall, California, '16, who is now in charge of information at Yosemite National Park has been at Berkeley for the last two months, working on a large scale relief map of the Yosemite Valley. The map, which will be installed in the exhibit building at the park, will be nearly enough completed at the time of the convention to give the delegates a splendid idea of the conformation of California's most scenic valleys.

Professors Bruce and Metcalf are assisting the Union Lumber Company at Fort Bragg in the preparation of a comprehensive plan of management for redwood cut-over lands.

IDAHO SCHOOL OF FORESTRY

MR. J. B. TAYLOR, United States Forest Examiner, Gallatin National Forest, Montana, has been given temporary leave of absence from the United States Forest Service in order to take the newly created position of Instructor in Forestry for the winter term at the School of Forestry of the University of Idaho, at Moscow, Idaho. Mr. Taylor will handle courses in grazing, silviculture and topographic surveying and his experience with the United States Forest Service and the United States Army Engineers in France fits him unusually well to present these subjects to the students in the most practical way.

ROTARIANS ENDORSE FORESTRY

STRONG resolutions were recently passed by the Rotary Club of Helena, Montana, endorsing and supporting the proposal to secure an appropriation for establishing a forest experiment station in northeastern Montana and urging its representatives at Washington to use their influence in its behalf. The resolutions are based on the constant need of reforestation in the great forested areas of Montana, western Washington and central and southern Idaho due to loss by fire and other damage, and the great importance of the efforts of the American Forestry Association to secure the establishment of the station covering the States of Montana, western Washington and central and northern Idaho were commended in the resolutions.

RESOLUTIONS BY NEW YORK ASSOCIATION

THE New York State Forestry Association at its Ninth Annual Meeting, held in January, passed resolutions vigorously endorsing the proposed legislation to provide an adequate basis for forest taxation and the proper handling of our forest lands, and expressing their interest and support of the constructive work being carried on by the several State agencies concerned with administration of State forests and the education of the people of the State in forestry, as well as the extension of fire protective work to include all the forest lands of the State. In a final resolution the Association favors the granting of increased appropriations by the Congress of the United States for fire protection and the acquisition of forest lands under the Weeks Law.

USE OF WOOD BY THE FARMER

"AGRICULTURE is the greatest wood using industry of the United States," said Colonel W. B. Greeley, Chief of the United States Forest Service. "Forty-six per cent of all the wood which the country consumes annually is used on its farms. The yearly lumber bill for farm structures and improvements aggregates six and three-quarters billion board feet! Farm requirements for boxes, barrels, and other articles manufactured from wood call for nearly four billion board feet additional each year. Add to these requirements the eighty million cords of fuel wood consumed annually by farmers and over a billion cubic feet of fencing material and it is easily seen that farmers have a greater interest in an assured supply of timber at reasonable prices than any other class of American citizens.

"The farmer is the most independent of anyone in the nation when it comes to food. He might be equally independent in the matter of timber. He owns, in the aggregate, more forest land than the lumbermen and all other private owners com-

bined. Farm woodlots, or woodlands, reach the enormous total of one hundred and ninety-one million acres and comprise two-fifths of the forest area of the United States. East of the Mississippi River they cover one hundred and fifty-three million acres, or forty-five per cent of all the forests. A rough estimate places the timber standing in the farm woodlots of the Eastern States at three hundred and forty billion feet, or forty per cent of the timber in this region. And this quantity includes over half of our remaining hardwoods."

PENNSYLVANIA DISTRIBUTES FREE TREES

THE Pennsylvania Department of Forestry will distribute free this spring about 3,500,000 forest tree seedlings to private land owners in the State, according to a statement issued by Gifford Pinchot, the Chief State Forester. Last year 2,748,120 seedlings were given without cost to 792 private planters.

Since 1903, when the State nurseries began producing young trees, the total output has been 45,909,309 seedlings. About 34,000,000 of them have been planted by the Department of Forestry on State forest lands, and the remainder have been planted by individual land owners. Some of the largest plantations have been established by coal mining, water and lumber companies. Scores of farmers, however, have planted thousands of seedlings on waste and idle land that is not suited for growing agricultural crops.

The Department's supply of black walnut, white ash and Jack pine seedlings is completely exhausted. The output of Norway spruce and honey locust is being applied for in such quantities that it soon will be gone. There is available for future applicants, however, a large supply of white pine and pitch pine seedlings.

GOVERNOR FAVORS OPENING NEW YORK FOREST PRESERVE

THE Empire State Forest Products Association has sent out a ballot to its membership to learn the consensus of opinion regarding the proposed opening of the forest preserve, which was advocated by Governor Miller in his message to the New York State Legislature in January, when he said:

"I invite attention to the question whether the time has not arrived for the State really to conserve some of its natural resources. Valuable timber is annually going to waste in the forest preserve. It seems to me that a plan ought to be devised to utilize such timber in a way to protect and improve the forest preserve and at the same time produce a substantial revenue and prevent waste of valuable timber, which is greatly needed. Of course that will require a constitutional amendment. I recommend the subject to your careful consideration."

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No tuition is charged for any of the above courses, and otherwise expenses are the lowest.

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For Further Particulars Address

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Lumbermen and others desiring instruction in special subjects may be enrolled as

Special Students.

A field course of eight weeks in the summer is available for those not prepared for, or who do not wish to take the technical courses.

For further information and catalogue, address: The Director of the School of Forestry, New Haven, Connecticut, U. S. A.

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Believing that the work of the college of forestry is to assist in the proper utilization of the products of the forest, the college will, in the spring of 1921, give, in addition to its regular undergraduate, graduate school and ranger school courses, its third season of special short courses for men now in the industries. Specialists in the special branches of instruction will be in charge of instruction.

The Short Courses will conclude with the holding of the

SECOND ANNUAL FOREST WEEK
EARLY IN APRIL

For further information write to Franklin Moon, Dean, New York State College of Forestry at Syracuse, New York.

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For announcement giving Complete information and list of alumni, address

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